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Boiler Explosions.

IT is surprising how slow men are to apply the lessons which the experience of other men teaches them. Only when the experience becomes his own does the ordinary man begin to amend his ways. The truth of this is annually illustrated by the numerous boiler explosions which every keen frost brings in its train, with their harvest of damages to property, maiming, and death. Year after year the same object-lesson is taught throughout the length and breadth of the country—boilers burst because of frozen pipes. And yet, year after year, new boilers are fixed without the slightest attempt being made to lessen the risks to which every winter exposes them.

Mr. Lavington E. Fletcher, Chief Engineer of the Manchester Steam-Users' Association, has published a list of the "Kitchen and Circulating Boiler Explosions" which occurred during the sharp frost from Friday, January 5, to Tuesday, January 9, this year. For this period of five days no fewer than thirty-eight explosions are recorded, and it is more than probable that many others occurred which have escaped public notice. Of these thirty-eight explosions, twenty-three arose from ordinary kitchen circulating-boilers, and resulted in the death of ten persons and injury to twenty-nine others. The remaining fifteen cases were explosions of heating apparatus boilers in churches, chapels, schools, and other public buildings, and resulted in the death of two boys and injury to four men. All were due to the same cause—fires lit under the boilers when pipes were choked with ice; in other words, the circulation of water was stopped by ice, the boilers practically becoming sealed vessels, from which the gradually-accumulating steam-pressure could find no outlet save by bursting them. Steam is a good servant, but, like other servants, it must have certain liberties if peace is to be maintained.

One of the explosions included in Mr. Fletcher's list is the one which occurred at Adel Reformatory, near Leeds, on January 6 this year, and which has been made the subject of a recent investigation under the provisions of the Boiler Explosions Act, 1882. In this case the boiler was of the saddle type, made of wrought-iron plates welded together, and connected with two systems of flow and return pipes, which ran round the lecture-room in which the Sunday services were held. It appears that, on the morning of the explosion (a Saturday), two boys lit the fire as usual, and that in about three-quarters of an hour the boiler burst, dislodging the brickwork, killing one boy instantly, and scalding the other so terribly that he died the following day. It is the old story of frozen pipes. The circulation was stopped by ice, and, as there was no safety-valve, the pressure of steam gradually increased till at length it rent the iron with the sad results just recorded. A few shillings spent on a safety-valve would, in all probability, have prevented this and the dozen or more similar "accidents" which occurred on or about the same date, but many heating engineers are apparently too thoughtless to provide this necessary appliance.

The plumber who had fixed the boiler at Adel stated in evidence that he had fixed several similar boilers, all without safety-valves, but he acknowledged that a proper valve would have prevented the explosion. Other evidence was given apparently with the object of discrediting the use of safety-valves, but the Commissioners, in delivering judgment, attached little or no weight to these opinions; on the contrary, they declared their conviction that such explosions could be prevented by fitting a good safety-valve to each boiler, and maintaining it in a state of efficiency. They also recommended that provision should be made for emptying heating pipes when the apparatus is not in use. This provision can so easily be made in low-pressure hot-water systems, such as that at Adel, that it certainly ought not to be omitted. All that is required is the fitting of a draw-off tap to the boiler and a stop-tap on the feed-pipe. But the high-pressure system of heating does not lend itself to such an arrangement.

It may be interesting to turn for a moment to the recently-issued "Report on the Working of the Boiler Explosions Acts, 1882 and 1890." This belated report refers to the twelve months from July 1, 1892, to June 30, 1893, and records seventy-two explosions, of which no fewer than twelve occurred in connexion with the heating apparatus of public buildings. The remaining explosions were of larger boilers used for developing steam for motive power in factories, ships, locomotives, &c., and do not fall within our province. Of the twelve explosions of heating-boilers ten* were caused by the pipes or connexions being choked with ice, and all these ten occurred in the five days from December 26 to December 30, 1892; four of the boilers were saddle boilers, three tubular, one cast-iron vertical, one wrought-iron annular, and one is described merely as "wrought-iron." One boiler was "new" when it burst, while the age of the others varied from two to sixteen years. The two explosions not caused by frost were due (1) to "undue pressure, the overflow pipe being choked by sediment," and (2) to "undue pressure, the circulation of water having been stopped by air in the pipes;" the former of these is described as a "rectangular" boiler, and the latter as a "tubular" one. This brings the number of exploded tubular boilers to four—*i.e.*, equal to the saddle boilers.

Fortunately, the death-roll from these "accidents" was small, only one person being killed; four only were injured. But this must not be taken as a full statement of the deaths and injuries caused by the explosion of boilers from frost in the year under consideration, for ordinary domestic boilers do not come under the Boiler Explosions Acts, and consequently statistics in regard to these are not given in the Report. The loss of life caused by the bursting of kitchen boilers is much greater than that caused by the bursting of heating boilers, and the provision of proper safety-valves is so much the more necessary. Unless persons responsible for the fitting of such boilers are more careful in the future to provide safety-valves than they have been in the past, it may be advisable to accept the suggestion of Mr. Howard Smith, one of the Commissioners in the Adel Reformatory Inquiry at Leeds, namely, that the provisions of the Boiler Explosions Acts should be extended so as to include the investigation of domestic boiler-explosions. Perhaps this would have the desired effect. Certainly the idea of imprison-

* The report itself says "eleven," but in an appendix, containing a detailed list of the explosions, only *ten* ar definitely stated to be due to frost.

ment for manslaughter would not be a pleasant one for architects and heating engineers to contemplate.

Another, and, probably, more useful method, however, of preventing explosions would be for corporations, local boards, and other authorities to include in their building regulations or by-laws a clause to the effect that a suitable safety-valve should be provided for every boiler, whether used for domestic purposes or for heating buildings. Certainly something ought to be done, and quickly, to prevent the deplorable loss of life which annually occurs from frozen pipes.

THE CHURCH OF ST. JOHN AT DAMASCUS.

By MR. W. R. LETHABY.

THE drawing by Mr. Spiers of the interior of the mosque at Damascus, published in the *Builder* of February 17, is a most invaluable record of a building of great historical interest, which has now been terribly injured by fire.

The covered part of the mosque consisted of a central part, three bays long, running *north* and *south*, with a dome over the middle; and right and left three large parallel aisles, which opened away on each side, eleven bays long in both directions. Both of these great wings were roofed alike, with three equal spans resting on rows of marble columns, a large number of which had capitals that appear to be Early Byzantine.

The centre and two wings cover a space about 450 ft. by 125 ft. Along the whole of the north side is a large open court, surrounded on three sides by an open arcade, which in part rests on marble columns with Byzantine capitals. The front of the *covered part* against the court-yard was an open arcade with a row of arched openings above. This double tier of openings was exactly repeated in the two internal longitudinal arcades. The whole of this composite building has usually been spoken of as the Church of St. John, and it is even said that from the Conquest to the time of Walid, Christians and Muslims divided the building between them, the former retaining the western portion, and the latter taking the eastern. The central portion is always referred to as the transept. Mr. Spiers, whose knowledge of Byzantine art is probably unsurpassed, suggests that the western part was the original nave, and that the eastern wing was added by Walid.

I wish to offer an interpretation, and to clear the ground I would make these suggestions and remarks:—

1. Such great size (say 300 ft. by 125 ft.) is unknown in an early eastern church.

2. The span of the "transept" is wider by some 14 ft. than the central span of the "nave"; this also is unparalleled.

3. There are no women's galleries.

4. There is no precedent for three equal spans in a basilican nave, nor for upper ranges of openings.

5. A dome or lantern at end is most unusual, and probably unknown in eastern buildings of early date.

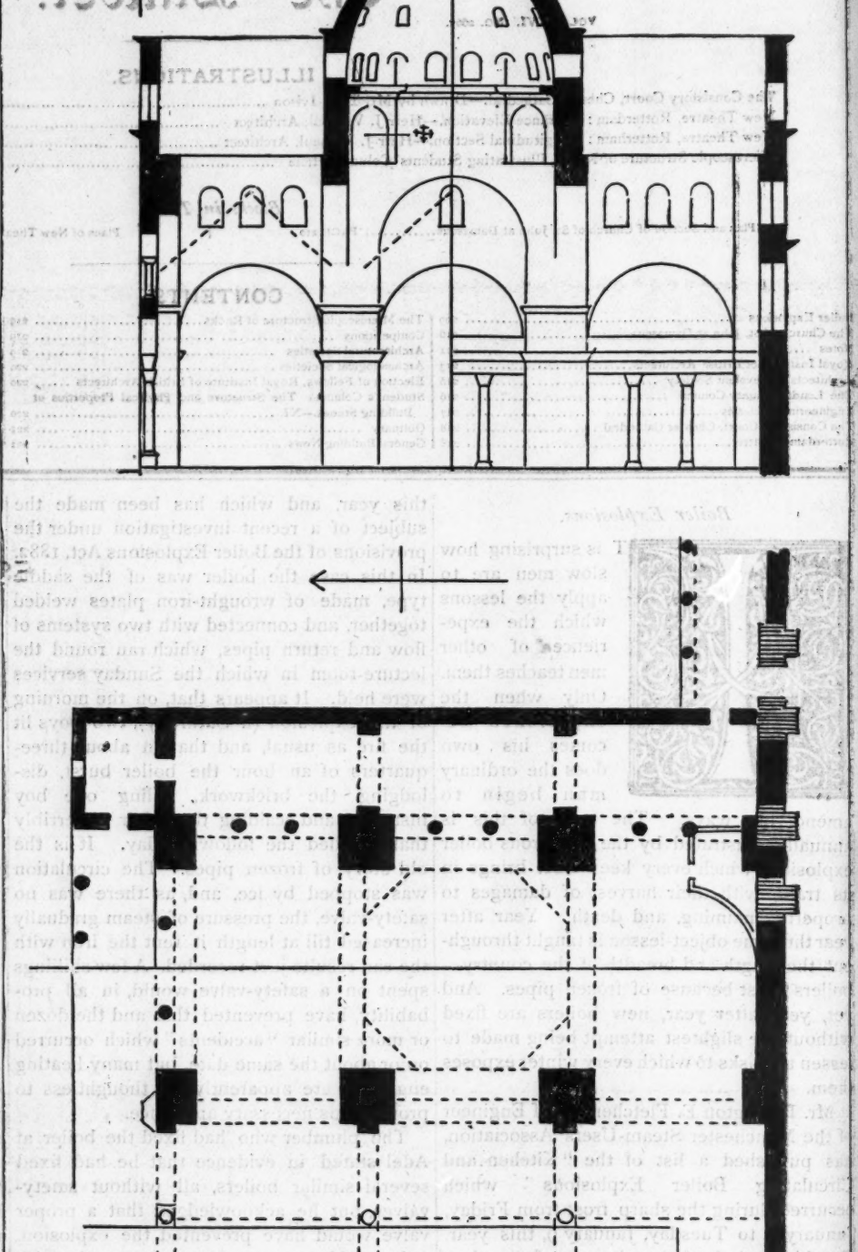
6. The transverse building is much the highest; it has continuous walls, with windows high up, which were partly blocked by the roofs of the east and west wings.

7. The end of the transverse building is evidently the main entrance out of the great court, and is opposite the fountain, as was usual in atrium courts.

8. The north side, for the whole length, opening with arcades to the court, is an impossible arrangement for a church.

9. The east and west wings being exactly alike, there is no reason for taking one as a portion of the old church and not the other. The whole forms a regular and perfect mosque.

10. If one wing only had belonged to the church, it would have been in a corner of the court.



Plan and Section of Church of St. John at Damascus.

The central "crossing," with the four great piers and the niches at the angles, is engraved by Choisy in "l'Art de Bâtir," and a comparison of it with the church in Isauria, illustrated in the last supplement to the *Hellenic Journal*, will prove it to be of similar date—the reign of Arcadius. Here the crossing is greater transversely to the length of the church, and it is in the middle. Here also are similar niches across the angles above. The preparation for the dome of St. Sergius at Constantinople is but slightly developed from this, the niches being "slurred" into the domed surface. The Damascus dome itself above the cornice is, I suppose, Arab work. If the court, the entrance, and the "crossing" be original, this would throw the axis of the church north and south. This direction is unusual, but by just adding enclosing aisle walls we obtain a very perfect early Byzantine church of large dimensions, and it at once appears how easily the Arab builders (if my supposition is correct), by taking down the aisles, made their wings of three spans open out from the lateral arches of the church.

In Fig. 1 the bottom part shows the present arrangement with two of the eleven bays of the west wing. The other half shows the suggested original state.

Fig. 2 is a section from north to south through the centre, in which the left-hand part shows the present state, with the lines of roofs

of the extensions blocking up the windows dotted. The right side shows how women's galleries may have been obtained, and the whole has a remarkable resemblance to St. Irene. My sketches are compiled from M. Choisy's plate, Mr. Spiers's sketch, the published plan, and several photographs.

It is known that the present mosque stands within the temenos of a late Syrian temple of the style of Baalbek and Palmyra. At Palmyra there is a similar great colonnaded court within which the temple stood, with its axis *north* and *south*. The temple of Baalzamin, also near Damascus, is entirely similar in respect to its enclosure and direction.

Now, at Damascus, the south wall of the church coincides with an ancient wall, and a fine ancient triple gateway occurs where shown on our plan. I suppose that the church was backed against the old boundary in a large court which was formed about it—east, north, and west. The situation on an old site, and partly on old walls, may have furnished the reason for its pointing south. This direction, however, is not without parallel.

De Vogüé gives an engraving of an important fourth-fifth century church at Quennaouat, in Syria, which has its atrium to the north and its sanctuary exactly south. Other examples might be given; all the early Jewish synagogues in Syria lie on a meridian.

The square end is, again, not without precedent; the early Syrian church at Behio, ("La Syrie Centrale,") is square-ended, and there seems to have been an actual prejudice in this region for making the sanctuary end *square* on the *outside*, only forming the apse within; and this may, of course, have been easily accomplished for the ground story at Damascus, as suggested on the plan.

NOTES.

THE London and India Dock Company have been making, during the past year, very great improvements at the Blackwall end of their West India Docks. The old entrance, which was only 45 ft. wide, has been entirely reconstructed, and its width increased to 60 ft. The locks leading to the import and export docks have also been rebuilt, and increased in width to 60 ft. The work is being carried out under the direction of Mr. H. F. Donaldson, the engineer to the dock company, by Messrs. Lucas & Aird, and is now well advanced, the rebuilding of the import lock being completed. The swing-bridges over these inner locks, which carry the railway traffic between the Millwall Junction and South Greenwich stations, have been lengthened to suit these alterations. This work has been done by Messrs. Sir William Arrol & Co., who adopted an ingenious method of accomplishing a somewhat difficult undertaking. As the railway traffic over these bridges could not be interfered with, the structures were temporarily supported on timber trestles resting upon the bottom of the lock. The lattice webs of the main girders were then entirely removed, and the top booms raised such a distance that the stress due to the additional length that had to be added to the end of the bridges, remained the same as formerly. By this means the booms of the girders required no alteration, and only new webs were necessary, in addition to the portion required to lengthen the bridges.

WE regret to notice that the Corporation of Sheffield have received (and apparently mean to act on) a recommendation of a special committee appointed to consider the subject, to the effect that the City Surveyor, if his office and staff are reorganised, will be able efficiently to carry out any architectural work required by the Corporation. The effect of this will be that architectural work done for the Corporation will be reduced to the level of official architecture, and we all know what that generally means. The Sheffield Society of Architects and Surveyors addressed a protest to the Corporation against this intention, on the ground that the City Surveyor had work enough to occupy him in the ordinary exercise of his proper functions, that architectural designs made by assistants in his office were not likely to be of the highest order, and that the design and erection of public buildings furnish some of the best opportunities which architects seek for the legitimate display of their abilities, of which they would be deprived under the proposed new departure. This latter is in itself a perfectly legitimate reason for the architects to urge, however little weight it may have with the City Council. Sheffield contains some very able architects, who have far more than a local reputation, and it is paying them a very poor compliment to propose to dispense with their services for the future. But it is an even more important consideration that the architectural character of new buildings in the city must inevitably suffer by their design being relegated to an official department. It always has been so and always must be so. The persons who are suited to and will put themselves into official harness are scarcely ever the class of persons who will impart artistic feeling and effect into works of architecture. Recent criticism in America has attributed the poor and uninteresting character of public buildings in the United States mainly to the fact that the system of designing such buildings in the municipal offices has been paramount, and there is a strong and growing public feeling against it. In our own country the poor, tame, and uninteresting buildings which have been erected for the Post-office department in various towns in England, from designs prepared in the Office of Works, are so many witnesses of the fatal effect of officialism in connexion with architecture. If the Sheffield Corporation carry out their intention, they will be doing more than casting a slight on their leading architects; they will be taking the worst step for the architectural adornment of their own city. Perhaps the latter consideration may move them, if the former does not.

DR. PAUL KRETSCHMER has done good service to archæology by the publication of his book on the inscriptions of Greek vases, just issued. In his preface he draws attention to the fact that we have in the material so collected a new source for the knowledge of the popular as opposed to the literary speech of Greece. Many forms that have been supposed to be mere cases of mis-spelling are, in reality, instances of popular speech actually current at the time. The writer deals with the the inscriptions from the point of view of linguistic form, not subject-matter, hence detailed criticism would have been out of place, but the book is one that no student of vase-paintings can afford to neglect, because necessarily the question of dialect throws light on that of *provenance*. To take an example, the interesting Euphorbos plate in the British Museum, as it was found at Cameiros, has been usually classed as Rhodian, but a comparison of its inscriptions with those undoubtedly known as Rhodian, show that, according to Dr. Kretschmer, the plate was imported from Argos.

WE hear that no less than seventy-six designs, sixteen of which are from England, have been sent in for the competition for two new bridges across the Danube at Budapest. The jury appointed by the Hungarian Minister for Commerce met, under his presidency, for the first time on the 18th ult., when a sub-committee, composed exclusively of members of the architectural and engineering professions and artists, was appointed to conduct the preliminary examination of the designs. At the invitation of the Minister of Commerce to the respective Governments representatives from Vienna, Paris, Berlin, and London have joined the committee. The result of the adjudication is not expected for several months.

THE Hygienic Congress to be held at Budapest in the autumn seems to be succeeding in its preliminary arrangements to an extent which may be called almost alarming, since we are informed that there are 362 Hygienistis and 78 Demographists already entered on the lists, who will read 440 papers. By what division of labour these are to be got through in eight days it is not easy to imagine. The number of the sections has been increased by one, the "Samaritan Congress" having consented to amalgamate with the general Congress, but we presume this institution will bring forward its own papers as an addition to the 440. It is announced also that the medical officers of the German railways, and the cremation societies, will also hold their meetings at Budapest in connexion with the general Congress. But who is sufficient for these things?

THE reception given by Mr. and Mrs. Edric Bayley and the members of the Governing Body of the Borough Polytechnic Institute on Thursday evening, March 8, gave an excellent opportunity to a number of visitors of carefully examining the working of a Polytechnic Institute. Much has been written about the starting of Polytechnics, the provisions of the necessary buildings, and the collection of funds, but owing to the organisation being a novel development the actual working of the schemes is not quite so familiar. It is within recollection that this Institute acquired the buildings of the Pastor's College at 103, Borough-road, and under Mr. Rowland Plumbe sundry alterations were made and extensive workshops added. The reception gave an opportunity of examining the new workshops and seeing the educational and social departments in the ordinary course of work. The workshops have been added at the back on the ground floor, and are mostly top lighted, and comprise bookbinders', mechanics', bricklayers', metalplate, engineers', carpenters', pattern-makers', and plumbers' workshops, and a smithy, the necessary power for the engineers' workshop being supplied by gas-engines. The rest of the building is devoted to lending library and reading-room, billiard-room, gymnasium, and offices. On the upper floors are concert-rooms, engineering and building construction studios, photographic studios, modelling rooms, and chemical laboratories. The Institute is available for men and women under certain restrictions, and the numbers attending, with more or less regularity, are little short of 2,000. The objects of the scheme appears on the first page of the second annual report which is before us, and are declared to be "the promotion of the industrial skill, general knowledge, health, and well-being of young men and women belonging to the poorer classes. This has been done by the organisation of educational classes, designed to reach young men and women in every branch of business or trade, free lectures and entertainments, clubs and societies—social and athletic, provision of reading-room and library, and a variety of social agencies." The fees, which are extremely low, and range from 1s. per quarter to 1*l.* per annum, are quite inadequate to meet the outgoings, but grants are to be obtained from the County Council, and the receipts for the year 1893 show that considerable additions to the Institute's income were derived from the central governing body of the City of London Parochial Charities, from Herold's Foundation, and from the Central Governing Body. An interesting analysis appears in the report of the trades followed by the men and women members, and amongst the men

the highest number of 505 appears under the heading of clerks, followed by 95 compositors, 86 engineers, 79 warehousemen, and 69 shopmen. These are only a few in a long list of 100 scheduled occupations. Amongst the women, the highest number of 271 appears under the heading miscellaneous, followed by 77 dressmakers, 67 clerks, 42 machinists, and 39 shopwomen, in a list of 77 scheduled occupations. From what we have seen and from a careful perusal of the last report, there seems little doubt that this and kindred Polytechnics are on the threshold of a great educational and social development which cannot fail to have an entirely beneficial influence upon the members who are disposed to avail themselves of its privileges, and in this work we wish the governors ample funds and the success which, with wise management, is sure to follow.

A NUMBER of architects and representatives of the Press assembled at the works of the Marble (Moreau-Rae) Syndicate, Limited, in Chelsea, on Wednesday last (14th inst.), to witness the methods adopted by that firm in producing marble from earthy limestone. The invention, we are informed, is of French origin, and has only recently been introduced into this country. The majority of inventions which profess to harden stone artificially, or to produce marble from the softer kinds of stones, merely succeed in putting a hard surface on the material, which is then capable of being enamelled, or otherwise coloured. Thus the bulk of the stone remains as before, except that it has a harder surface. The result is that moisture is liable to collect behind the skin, and the face flakes off. The effect produced by the Moreau-Rae process, however, is entirely different; so far as our limited observations permit us to judge, the stone operated upon is hardened throughout, so that not only is its surface capable of being polished, but the block being cut through in any desired direction the cut surfaces may also be polished. The process may be briefly described as follows. A slab or block of chalk, Bath or Portland stone—in fact any absorbent stone containing a large percentage of either the carbonates of lime or magnesia, or both—is suitable for the purpose. A tank of water is prepared, and varnish, coloured with some pigment, is dropped on to the water and spreads unevenly over its surface. The skin of varnish is broken up through the medium of some fluid which may be applied by a brush-sprinkler, or otherwise, the varnish at the same time forming in patches and streaks. A face of the stone to be operated upon is now dipped into the water, when the streaks and patches of varnish adhere to it; the material is afterwards dried. Subsequently, it is immersed for a few minutes in tanks containing sulphate of iron, copper, zinc, &c., according to the tints required. The sulphates will not penetrate, or only slightly, those portions of the stone covered with the varnish, and thus a pattern is produced; which, however, is not apparent until the material is immersed for about half-an-hour in water having a temperature of approximately 120 deg. Fahr., which assists in the alteration of the sulphates into carbonates. Up to this point the only thing accomplished is the staining of the stone throughout. It is then subjected to the hardening process, which indurates not only the surface, but the interior of the stone. To all intents and purposes a block of marble has been produced which may be polished in the usual way. So far as colour is concerned, any tint or combination of tints can be produced; but the colouring is not so intense in the interior of a block as at and near the surface. Judging from samples exhibited, it would appear also that the tints have a tendency, inside the stone, to run in zones parallel with the surfaces exposed to the sulphate solutions; and there are some other points that seem to admit of improvement. The change the stone undergoes is mainly a chemical one; whether its structure is in any way modified is a matter upon which we cannot venture an opinion without a more detailed examination. It is certain, however, that it gains considerably in weight proportionately to its degree of porosity. On the whole, this is the most successful attempt we have hitherto seen of producing marble artificially. The practical application of the invention lies in the circumstance that limestones may be carved and moulded when soft, and then "made into marble," whereby a considerable saving in expense is effected over the difference of carving in real marble—that is to say, for those who think that such jugglery with material is any addition to architecture. We are certainly not among them.

THE fourth of the course of lectures on matters connected with building, which the Carpenters' Company have arranged for, took place at Carpenters' Hall, London-wall, on Wednesday, when Professor Banister Fletcher lectured on "Englishmen's Home." The lecture was an attempt to describe the Englishman's home from the time of William the Conqueror to Victoria, from the Anglo-Saxon hall to the modern mansion; and since the lecturer had little more than an hour in which to deal with a subject which would require many hours to adequately discuss, his remarks consisted practically of a synopsis of the subject. He was able to do little more than enumerate some of the many charming castles and manor houses of the eleventh and succeeding centuries, but his audience must have been grateful to him for showing a fine collection of lantern slides and photographs, which, had the lecturer been less ambitious in the treatment of his subject, and thereby left more time for their inspection, would not have been so hurriedly shown.

THE accident at the Charterhouse School at Godalming, from the sudden giving way of a temporary platform, 14 ft. high, with five-hundred boys on it, is one about which we ought to have further information. Five boys, it appears, have sustained severe injuries; and it is only by good luck that the results were not a good deal more serious. Who was responsible for the construction of the platform and for assuring the head master that the structure would bear twice the weight it was required to bear? and is not such an erection within the power of inspection of any official surveyor in the district? The public, as well as the parents of the injured boys, will certainly require to be satisfied on these points.

TWO interesting properties in Surrey will shortly be offered for sale — viz., Imber Court, near Thames Ditton, with grounds of about 70 acres, watered by the Mole, and with a house attributed to Inigo Jones. The manor of Imber, or Imworth, passed from the Brasse family to their heir-general, Thomas, Duke of Norfolk, and then, having been annexed by Henry VIII. to his chase, Hampton Court Chase, was restored on a petition addressed to the Protector Somerset. In 1630 it belonged to Dudley Carleton, Viscount Dorchester, whom his nephew, Sir Dudley, succeeded there; in 1720 to Henry Bridges, who settled it upon his niece on her marriage with Arthur, afterwards Speaker, Onslow, and there the Onslow's lived for some while. Sir Francis Burdett also resided at Imber Court. Two wings were added about one hundred years ago to the house, which was built of brick and stuccoed over. The other property is that of the manor-house, Upper Tooting, which in name, at least, carries us back to the Conqueror's time, when Haimo (de Gravenell) the sheriff, held Tooting of the Abbot of Chertsey. In the reign of Henry II. a de Gravenell bestowed the manor-tithes and the church advowson upon St. Mary Overeye's, Southwark. The manor has had many famous owners, including the Dymock, Maynard, and Whichcote families. Sir Henry Maynard, whom Queen Elizabeth honoured with a visit at Tooting, was Lord Burghley's secretary. In 1717 Alderman James Bateman bought the manor, and in the next year was buried with much pomp in the old church. In 1767 it was bought for 25,000*l.* by Morgan Rice, a distiller, who built Hill House, near the church. The church was rebuilt in 1833, and enlarged after the designs of Mr. St. Aubyn, in 1873-5.

THE exhibition of the Society of Painter Etchers at the Watercolour Society's room is, as usual, a very interesting one, though one or two of the best etchers of the day are not quite as well represented as they have been on previous occasions. Still, there is a great deal to look at, both within and without the true scope of etching. This, as we have before urged, consists really in the free indication of effects of composition and of light and shadow contrast, not in high finish, in which this freedom of line is lost, and the work becomes only an engraving done by a different process; it may be very admirable in its effect, but it loses the character belonging specially to etching. A comparison of two subjects from "Sandwich," nearly from the same point of view, will illustrate this; No. 14, by Mr. Percy Thomas, and No. 63, by Mr. H. R. Robertson. Both are good, but the former is an etching, the latter is an engraving. Compare again Mr. Gascoyne's two fine sketches, "Showery Weather" and "Windy Weather" (21 and 52), with Mr. Dalgleish's "The Coming Storm" (139). In the former the mass and movement of the clouds is just indicated broadly; in the latter the effect has been spoiled by the attempt to shade up the clouds into a realistic effect, which the method of etching is not fitted to accomplish. Mr. Massey's broad sketches (152, 155, 161, 162) may similarly be compared with Mr. Murray's neat vignettes near them (were they hung in juxtaposition on purpose to point the moral?); the latter are prettier, the former have more life. M. Legros' remarkable collection at the top of the room contain things, it is true, which are rather too ostentatiously rough in workmanship, but some of these are very fine in suggestion, especially the landscape effects; "Lisière de Forêt" and "Paysage au Bateau" (102, 103) for instance. There is an impressive and gloomy poetry in the two subjects entitled "Triomphe de la Mort" (89, 90). Mr. Haig manages to preserve a great deal of the special character of etching in his large and highly-worked plates "Amiens Cathedral" (37), "San Juan de los Reyes" (41); the latter, though smaller and less remarkable at first sight, is the finer work of the two. Mr. Short has some excellent small etchings, but hardly equal to what he has done. Mr. Herbert Marshall contributes some etchings of London. Among other works may be mentioned those of Mr. P. Robertson; Mr. Alfred East, especially an admirable study of rainy effect in "The Last at the Fair" (114); Mr. Slocombe; Mr. R. Goff; and the admirable and inimitable dry-point studies of M. Helleu. Mezzotints, like those by Mr. Knight, excellent in their way, should be noted in the catalogue as "mezzotint;" the public are ignorant enough as to what etching really means, without being misled by the catalogue. Mr. Strang's contributions seem to show less of genius and more of ugliness and eccentricity than before, and his way of executing half-length portraits by working up the face only and leaving the coat, &c., nearly untouched, gives his subjects the appearance of being "persons of colour," as negroes call themselves in the States.

THE Exhibition of the Institute of Painters in Watercolours contains a few very interesting works amid a great deal that is of little interest. The President's central work, "Katherine" (265), is a very uninteresting woman clad in dress which makes a fine harmony of colour. Among other figure pictures may be mentioned "Claret and Small Beer" (345), by Mr. F. Dadd, one of the best in the room in the way of drawing and character; "The Ball at Dr. Blimber's Establishment" (420), by Mr. H. R. Steer; "A Lesson in Geography," by Mr. Townely Green (346: the shadows on the man's face are surely too red); "An Old-fashioned Christmas Dinner" (377) by Mr. C. Green, clever in character but dreadfully hard in execution. "The Guerdon of Folly" (16), by Mr. Bundy, is much too good in drawing and character for the loud colour and the lack of interest in the incident. "Autumn, a Caprice," by Mr. Fowler (212), is a fine piece of vague colour. Among landscapes and architectural works there are some fine things: "A Breezy Moorland" (94) by Mr. R. B. Nisbet; "Cornfield, East Ashling" (155), by Mr. Wimperis, and one of the best of his works we have ever seen; "Steaming into Lincoln" (217), by Mr. Cotman; "The Rising Moon" (262), by Mr. Aumonier; "Corfe" (272), a little masterpiece by Mr. E. J. Gregory; "King's College Chapel and Entrance" (321), by Mr. Fullylove; "The Milk" (381), a little coast scene full of air, by Mr. J. White; "Nineburrow Down, Dorset" (395), by Mr. H. G. Hine; and "Early Autumn on the River Tay" (657), by Mr. Nisbet. "Waiting for the Coach" (661) is a good study of figures and interior by Mr. E. C. Clifford. Mr. Harry Hine's large view of York Minster from the south-west (612) is too much like the old style of cathedral views, with a false colour on the building and a studied look of dilapidation in the surroundings which does not in fact exist.

ROYAL INSTITUTE OF BRITISH ARCHITECTS:

LONDON STREETS AND BUILDINGS BILL.

A SPECIAL general meeting of this Institute was held on Monday when, on the motion of the President, Mr. J. Macvicar Anderson, it was decided to present the Royal Gold Medal for the current year to Sir Frederic Leighton, Bart.

The tenth general meeting was next held, when the following gentlemen were elected:—As Fellows, Messrs. John Perrins Osborne, Thomas Battesbury, Walter Talbot Brown, David Jenkins. As Associates:—Messrs. Charles Kempson, Leicester; Harry Barnes, Sunderland; John Ernest Mowlem, Swanage; Henry Dearden, Batley; Edward Box Wetenhall, Finsbury-park, N.; Ernest Robert Barrow, 76, Mount-street, W.; William Henry Ashford, Penrally; Arthur William Sheppard, Architect's Office, School Board for London; Harold Clapham Lander, 6, John-street, Bedford-row, W.C.; David Forbes Smith, Salisbury; William Tillott Barlow, 23, Finsbury-circus, E.C.; Francis Peter Halsall, Southport; George Ernest Nield, Monument Station-buildings, King William-street, E.C.; John Robert Earnshaw, Manchester; Franklin Kaye Kendall, 1, The Paragon, Blackheath, S.E.; Roger Francis Bacon, Reading; Harry Evan Jones, 9, Moorgate-street, E.C.; John Rennison Little, Bolton; Arthur James Forge, Woodford, Essex; Frank Lishman, 51, Grandison-road, Clapham-common, S.W.; Arthur Hill Morgan, c/o T. M. Lockwood, 80, Foregate-street, Chester; Douglas George Salier (Tasmania), 11, Spring-gardens, S.W.; John Lloyd Houston, 13, Furnival's Inn, E.C.; George Harry Mael Trew, Woking; John Humphreys Jones, B.A.Lond., 9, Moorgate-street, E.C.; John Newnham, 61, Palace Gardens-terrace, Kensington, W.; William John Childs (New Zealand), 7, Cedars-villas, Putney Bridge-road, S.W.; Alfred Kirk Brown, c/o Messrs. Smith & Brodrick, Cogan-chambers; and Preston, Hull.

A discussion on the London Streets and Buildings Bill, promoted, as a private Bill, by the London County Council, and entitled "A Bill to consolidate and amend the enactments relating to Streets and Buildings in London," the suggested short title of which is "The London Building Act, 1894," was then opened by Mr. Arthur Cates, Past Vice-President, who read a short paper. He said that in considering the Bill great difficulty arose from the fact that this Bill "For the Consolidation and Amendment of the Enactments relating to Streets and Buildings in London" did not contain the slightest indication as to what was consolidation, what was amendment, and what was new. A draft Bill should have been circulated with references and explanations, and the new parts printed in different type from the old. In regard to Part I., on the Formation and Widening of Streets, although this part was to a considerable extent only a paraphrased re-enactment of existing laws, there were proposed extensions of the law which would give rise to some opposition from those who appreciated the possible effect which might result from its provisions.

The general powers sought in this part apparently affected not only new streets but the widening of old ones, and in this latter respect especially demanded the most careful scrutiny.

Clause 7, by which the Council might require a greater width of street than 40 ft., was especially important as directly applying to not only new but to old streets, so that if it should be desired to widen an old street to 40 ft., the Council might insist on its being made wider up to 60 ft. Some modification of this clause might be found possible, which might in some degree remove the objections as regards old streets, by providing for payment for the injury done by the exercise of the powers given by the clause.

Clause 9, which regulates the position of new buildings with reference to streets, was, as it stood, objectionable, and should be amended and then limited to new streets. The expression "new building" occurred in this clause for the first time, and on referring to Clause 185, sub-Clause 18, eleven distinct definitions were found to be there given of these words.

He would say a word in favour of Clause 14, which in new streets enabled the Council to require as a condition of consent that beyond the full width of the roadway a space not exceeding 5 ft. should be left between the footway and the external wall of the houses; with some little amendment, that would be an admirable provision.

In Part II., dealing with lines of building frontage, Clause 15 was understood to be only a re-enactment of section 75 of the Metropolis Management Amendment Act 1862. But in 1890 the London Council were not sure as to their powers under this section, and in their General Powers Bill endeavoured to obtain direct power over corner sites: happily, the petition of the Institute, and its subsequent action before the Select Committee of the House of Lords on the Bill, were on this point effective, and the Act of 1890 contained in Section 33 limitations which confined these powers to new sites. This Act of 1890 was to be repealed, and the law would stand simply as set out in Clause 15, with the result that, if a building projecting at a corner beyond the line of buildings in the street was pulled down, the superintending architect might be called upon to define the general line of buildings in both streets, with the result that the corner building site might be cut down to a mere strip or vanish altogether under the operation of this clause. It was, therefore, imperative that some saving amendment should be made.

The novel and restrictive conditions in Part IV. in regard to open spaces about buildings and the height of buildings, had evidently been framed with great care and pains—with the desire to apply to the whole of London, old and new, present and future, legislative control which should in the end make it what in the eyes of the framers would be a model of sanitary perfection. But it proposed an ideal condition of things; and when brought to the test of actual application, the restrictions were found to be so oppressive and destructive that they could not receive any support from those who could appreciate the far-reaching and crippling effect which they would have on vast interests of occupation and business in other districts than the slums they were intended primarily to benefit. The provisions for compelling setting back in narrow streets could not have been seriously considered; they would be oppressive and obstructive in practice. The limit by Clause 36 of the height of buildings to 75 ft., except with the consent of the Council, was not unreasonable; but if the other provisions of this part became law the restrictions contemplated would render the cases in which the limit could be taken advantage of few indeed, since most new buildings would of necessity be kept down to the modest maximum of 40 ft. or even less. The two stories in the roof permitted by Clause 36 should, as also the whole roof, be required to be of fire-resisting construction.

In Part V., dealing with construction of buildings, the clauses from 39 to 68 were occupied with details and regulations affecting the construction of buildings, which in many particulars required technical amendment.

The introduction of scantlings for joists, in Clause 43, was undesirable; the whole should be eliminated, and if any minimum was to be fixed it should be done by by-law, and even then spans of 18 ft. and 20 ft. for single floors should not be recognised.

As regarded the construction of roofs (Clause 48), where there were any stories in the roof the floor of which should exceed 60 ft. above the street level, such roofs and stories should be of fire-resisting construction. There was not any provision for a continuous backbone to a party wall, or which would affect the common practice of so arranging flues in party walls that what professed to be a two-brick wall, 18 in. thick, was really a hollow wall of two outer faces, each 4½ in. thick.

The requirement under Clause 55 that "every habitable room shall be at least 8 ft. 6 in. in height" was excessive.

In Part VII., dealing with rights of building and adjoining owners, Clauses 72 to 86 were intended to embody the law affecting party walls, with certain modifications and amendments, all of which were not improvements. The chief points for consideration were:—The giving (under Clause 72, Sub-clause 6, p. 41) a right to the building owner to place on the ground of an adjoining owner the projecting footings and concrete or other solid substructure of his external wall, making compensation for any damage occasioned thereby. It would seem that the interests of the adjoining owner to be compensated should be represented by some word or words of wider significance than "damage." Clause 75 shortened the statutory period of notice from three months to two, a change the desirability of which was doubtful. In Sub-clause 2 of the same clause, obligation on the building owner to shore up the adjoining ground or building should be distinctly stated. The change made by Sub-clause (8) in the manner of settling differences appeared objectionable. The present system of three surveyors had worked admirably for nearly forty years. Clause 78, which provided for underpinning by a building-owner of an adjoining owner's foundations when they were within 10 ft. of the new building was new, and desirable. In regard to By-laws (Part XIII.) the powers given were very wide, and should be carefully guarded. The provisions for making By-laws known, and for appeal against them when desired, were very imperfect and unsatisfactory.

The existing legislation was the result of much discussion, and was nearly satisfactory; it was expressed in the Metropolis Management and Building Acts Amendment Act, 1878 (41 & 42 Vict. cap. 32), sec. 16.

There was one thing wanting in this legislation—the publication of the confirmed by-laws in the public press so that they might become known to all men—and it would have been reasonable to suppose that an Amending Bill would have made good this defect, and provided for full publicity being given to the by-laws by which the great interests of the Metropolis of the Empire are to be governed: but every safeguard of publicity had been carefully expunged; and the publication of regulations which might intimately affect the interests of the inhabitants of this city, was to be effected by the hanging up of a printed copy in the principal office of the Council; and the London Council was to be placed practically in the position of absolute power to make pretty well what by-laws it might like, and leave those subject to them to find out, as best they might, what they were.

In regard to legal proceedings (Part XIV.), Clause 150, relating to the Tribunal of Appeal, could not be passed without notice. The number of members proposed—five—was too great; with five members, of whom three would form a quorum, there might not be that continuity of view which a smaller number would insure, and the expense of the remuneration of the members would be greatly increased.

In regard to Part XV. (miscellaneous) he need only invite particular attention to Clause 185, "definitions," which required careful study and investigation.

On (14), p. 94, "base," he thought it almost certain that the words "or girder or bressummer" would be added, thus making the base of the wall on a bressummer the top of the bressummer, which, with the addition of "to include bressummers," in Art. 1 of the First Schedule,

p. 101, and the application of "base" as defined by Art. 6 of the First Schedule, p. 102, defining the manner of measuring the height of a wall, would remove the great difficulties which existed at present in dealing with the front and back walls of business premises. There were various other definitions which might be amended, and in some cases those set out in the Draft Bill prepared by the Institute were preferable. All required careful consideration before they could be admitted to be correct.

It was hardly possible that even at an adjourned discussion the opinion of any large number of members qualified to express them could be obtained; he would, therefore, suggest that it would be a great assistance to the Practice Standing Committee if members would send to the Secretary of the Institute any suggestions and criticisms they may desire to offer on foolscap written on one side only; and he was sure the Chairman of the Building Act Committee of the London Council, who was so anxiously desirous that the Bill should be made as perfect as possible in all technical detail, would be happy to receive suggestions at any time.

At the conclusion of Mr. Cates's remarks,

The President said they were favoured with the presence that evening of Dr. Longstaff, the Chairman of the Committee of the London County Council charged with this Bill. It would be only courteous to afford him an early opportunity for any observations he might have to make.

Dr. Longstaff thanked the meeting for giving him an opportunity of speaking at an early period, and considered that it might to some extent facilitate the discussion which was to follow. Mr. Cates had been in a position of peculiar difficulty in reading his paper, and they had found themselves in a similar position in the conference which had taken place. Mr. Cates had stated to him that anything which he might say would not be binding on the Council of the Institute, and he (the speaker) had similarly remarked that anything which he might say would not be binding on the London County Council. Therefore, they had been in a hypothetical state for some time, and it would be noticed that a good deal of the paper had been written in the form of very polite hypothesis. He was happy to be able to say, however, that a good many of these hypotheses had now become substantial facts, and that the ground had been a good deal cleared. With very few exceptions, if they omitted for the moment Part 1 and Part 4, he thought he might say that the County Council had accepted all the amendments suggested by Mr. Cates. There might be one or two small points, but very nearly all of the suggestions had been accepted. When it came, however, to the question of sanitary principles, he was afraid that the agreement was not yet so cordial as they might wish, but he thought he might say that the Committee in charge of the Bill, when they debated *in camerâ*, on the departure of Mr. Cates and his colleagues, agreed to accept such modifications of Part 1 of the Bill as they thought would satisfy the Institute. With regard to Part 4 of the Bill—the most difficult of all—he was not in a position to speak definitely, because, during the course of the Conference, methods of approaching the matter were sketched out, and these suggestions had to be considered very carefully by the committee. The committee had given certain instructions to the draftsman, and until they saw the result of these in print, and deliberated upon them once more, he was not able to say how far they would meet the wishes of the Institute. He might say this, however, that he believed it would materially modify the drastic and bald expressions found in the Bill before. In regard to one thing that Mr. Cates had said, he would like to add a few words in justification of the County Council. Mr. Cates had spoken with some severity as to the form in which the Bill had appeared, and as to its imperfections. That was due to many causes, but the prime cause was the modern ideal of doing everything by committee. He could not possibly conceive any worse instrument to be devised for drawing up an Act of Parliament than a committee. To begin with, the committee was not always there, and when it was there it was not always the same committee. Then a committee had the habit of losing its patience, not to say its temper; again it was not always consistent. These were difficulties inherent in all committees with which he had had to do, and they had been numerous. With a committee which had to meet once a week to discharge an agenda paper consisting on an average of eighty-five to ninety-five items, and had to get through legislative work, the difficulties were not diminished. The Building Act Committee had been now, for close upon five years, grappling with the subject, in all the odds and ends of time it could squeeze in, and the immense difficulties they had to contend with constituted one of the causes of the imperfections of the Bill. Another cause was this—when they had made up their minds, the matter had to be placed in the hands of the Parliamentary draftsman. Now, the Parliamentary draftsman had his own ideas, and not only that, but being neither a builder, architect, nor surveyor, he did not understand three-fourths of the technicalities of the Bill. He, therefore, introduced terms which, from his point of view, were all right, but the result was not always what might be anticipated. Then, again, their draftsman was extremely busy, and the Committee had little time to lose in bringing in this Bill, for next year there would be a re-election of the Council and another breach of continuity. Another difficulty connected with the matter would, he believed, be appreciated. They desired to consolidate, and it was only a question of how much they could consolidate. They had to draw the line at the sanitary laws, and it was found when they consolidated those provisions, and especially those relating to the streets, they had various Acts running over many years, and they had been drafted by various draftsmen. The phraseology of the different Acts was inconsistent, and, when they came to attempt consolidation, it was found that a great deal of re-writing was required. When that was done, there were all sorts of consequential inconsistencies, so that a great many of the provisions were now in a much simpler form of words, and altogether in a much more symmetrical form than had before been attained. He did not think that Mr. Cates was quite fair to them in regard to the by-laws. They had no intention of asking for power to do anything they liked, and he differed from Mr. Cates on the peculiar virtue of publishing the by-laws in the papers. Nobody would ever look for them in those periodicals, while the publications of the London County Council could be always obtained very near to Spring Gardens. Then Mr. Cates did not think that they went nearly far enough, but that they should appeal to owners to set apart a certain portion of their estates for open spaces. He was very glad to find that, in this matter, Mr. Cates was even more progressive than the County Council, and if he could get a clause which should compel every owner who built in the suburbs to devote a certain amount of ground to open spaces, he, the speaker, would not say nay. The great point on which there was a difference of opinion in this Bill was how far they were to be influenced, in the broad sense of the term, by sanitary considerations. The Bill pointed out, in the first place, how important the question was, and, in the next place, the particular things considered essential to health. If that was so, how were they to be obtained with the least interference with the rights of individuals? Although he attached very great importance to this clause of the Bill, he felt sure that the result of the conferences they had had would be eminently practical. He thought that the gentlemen representing this Institute and the Surveyors Institution, having shown that there were cases in which the principles laid down were not applicable, this would help them, because it would make it more likely that they would get at the remainder which were not exceptions. But it must not be supposed for a moment that Part 4 could be carried in the form in which it stood. Purposely the former savings in the old Act were omitted, notably the saving of exempting the City of London, for they considered that it would not be right to exempt the City and to include such districts as the Strand. They were aware that exemptions had been made as to certain classed property, and that no limits of area that could be drawn would meet the question; it must depend on something else than geographical or Local Government limits. In the course of this conference a clue had come, and it was to deal more rigorously with those dwellings which were likely to be tenanted by the poorer classes. They therefore proposed to accept that general suggestion, and to deal severely with that class of dwellings, letting other buildings off comparatively easily. There was one thing which the County Council was aware of—one inherent difficulty in the question. Any restrictions made upon building, in regard to space or anything else, would inevitably displace large numbers of people who now lived in London, and would send them to the suburbs. Indeed, here were many who looked upon this as a serious matter, but personally he did not take that view. The gain to health would be enormous, although it was quite true that the wear-and-tear of travelling would somewhat put things to the other side of the scale. He did not know that he could with advantage go more into detail. Before he sat down there was one thing he wished to say. In the first place, he was extremely grateful to the Institute and to its representatives who had given the Committee so much assistance. He knew from experience the labour that such work as that given by Messrs. Hall and Rickman involved, and they should be grateful to those gentlemen. The intercourse they had had with them had always been of the most agreeable character, and he hoped that they were not worse friends now than when they began, while if some of the spirit of hostility was to some extent removed, he for one should be very glad. They wished that this Bill should be one which should be carried forward with something like unanimity in the case of the various people interested, the professions concerned in building, as well as the controlling authority. It was not to be expected that they could always agree, and he questioned whether the members of the Practice Committee of the Institute had ever been quite unanimous on any one of the drafted clauses of the Bill. And if that were the case, was it likely that the Institute of British Architects would agree with the County Council, or that either of them would exactly agree with the Surveyors' Institution, or even with Parliament, which might differ from them all. But there was one thing on which he must take the opportunity of expressing his regret. There was one point on which he, as a Member of the Committee and the Council, had suffered a grievous disappointment at the hands of the Institute and of architects generally. The practical side of architecture, the structural and sanitary sides, were always of paramount importance; but in his humble opinion there was yet another side of architecture, which was of scarcely less importance—he alluded to the side of art. Now, they had not received any communications whatever from the Institute, or from any architects, as to any of the questions in the Bill which bore upon matters of art. He would be the last person to suggest that anything in the slightest degree in the sense of a censorship or control of art should be exercised by a municipal body; but the point was this, it was very evident to them as practical men that a set of building regulations might or might not have a tendency to influence art one way or another; it might be adverse to the interest of art, or it might be in favour of it. He had no doubt that many of them thought that the County Council did not care the least bit about art, but if they did so, they were making a great mistake. He did not suppose there ever was any body of men who, in their ignorant lay way, had a stronger desire to see London beautiful than the London County Council, and that feeling extended even to the extreme labour wing of the Council, who asked for guidance at the hands of architects, but who had never hitherto had it. So interested were they in art, that they deliberately laid down rules allowing architects to have, within certain limits, oriel windows, and they had modified the old restrictions about exposed woodwork. It was said to be a great hardship that people could not have wooden barge-boards and certain decorations for dormer windows, and the Council had inserted a special clause to allow these to be put up within certain limits. Then, again, they had endeavoured to control advertisements, which were by far the greatest enemies of architects. Take Ludgate Circus, for instance. He presumed that that open space might have been adorned by buildings of a very high standard of beauty, but, as it was, the whole thing was one blaze of letters and advertisements, so that instead of being beautiful, it was hideous to a degree. In fact, there was no relief to the eye until one came to the Law Courts, with the Bank of England on one hand and another bank opposite, all being buildings of a public character, with no advertisements to deface them. The Council had endeavoured to control that, but he was sorry to say they had received no help from the Art Committee of the Institute. There was one thing only in which they had made provision which might interfere with architects — they had limited the projection of cornices to 2 ft., but he thought that was a liberal allowance. There were a great many things which could only be done with the consent of the Council, which meant with the consent of the Building Act Committee; and there had been many cases in which, when a thing was objectionable in itself or ugly, they had refused to pass it. Some points were referred to as having possibly deleterious effect, for instance, that

the clause about advertisements, which compelled the use of fire-resisting materials, might drive the old sign-board out of existence and replace it by enamelled iron, which was decidedly ugly. But this suggestion had not come from the Art Committee, but he believed from the *Licensed Victuallers' Gazette*. Mr. Cates had objected to their streets being 40 ft. wide, with buildings 40 ft. high, but they had received no recommendations as to the height of buildings, and as to the ratio of 5 to 4, or 7 to 3, being more consonant with the ideas of beauty. They had only been told as to what sort of advertisements were good or bad. Another point was the question of the desirability of having the parapet of the party wall carried above the slates. This he considered undesirable and unnecessary in the case of small houses, the party wall going up through the slates being one of the most difficult joints to make between the slates and the brickwork.

Mr. John Slater remarked that he had taken a good deal of interest in building legislation, and some four years ago, in that room, he strongly advocated the consolidation and amalgamation of the various Building Acts, and the enactment of new provisions which would lead to more solid and sanitary building. He, therefore, welcomed the present Act cordially, because it had evidently been drawn with a sincere desire, on the part of its framers, to do away with a great many of the most flagrant abuses now existing. For a great many of the clauses and regulations of the Bill he had nothing but commendation, and he would fully admit that, if they were dealing with new districts only, there were very few of the provisions of the Bill he should like to see taken out. But the experience he had had, during the last few years, in erecting new buildings in parts of London which had previously been covered with buildings, had forced him to the conclusion that, if this Bill was carried without modification, it would prevent what it meant to accomplish, and would retard the improvement of many parts of the metropolis. He might take as a sample about one mile in radius from the spot in which they were then assembled. He would, therefore, strongly urge on the London County Council—and from the remarks of Dr. Longstaff, he believed they would listen to what was said—that they should seriously consider the objections to some parts of the Bill which had been made by Mr. Cates, and which would doubtless be enlarged upon by subsequent speakers. He was glad to hear from Dr. Longstaff that the County Council and their Building Committee were taking the view that the Bill was too stringent to apply in its entirety to all parts of London, because that admission would facilitate matters materially, and aid in getting a really good Bill passed. He agreed with Mr. Cates that there were some omissions in the Bill which it would be desirable to supply. He could not help thinking that the London County Council ought to have power to ensure that, in the laying out of new districts, certain portions were permanently retained as open spaces. Mr. Cates had not, perhaps, the reputation of being a Progressive Radical, but he was evidently in advance of the Council in what he had said on that point. He agreed with Mr. Cates's view, because one could see every single old building in the suburbs, with a fine garden attached, being pulled down and absorbed by the speculative builder. The County Council by its regulations made laws relating to the width of roads, and he felt confident that the support of everybody who had the interests of the Metropolis at heart would be given to the Council, if they endeavoured to ensure a certain amount of open space in new districts which were laid out for building. Then, again, with regard to public buildings, the provisions relating to these had been improved in the present Bill, these being taken almost verbatim from the wording of the Manchester Act. At the same time, as far as he was able to see, he could find no regulations which would enable the Council to forbid the erection of public buildings in restricted areas. Now, no public building ought to be erected with a frontage to one street only, but certain open areas should be left at the sides for means of exit. This was referred to in some of the regulations of the Council, but he believed it only applied to cases where there was more than one story in a public building. He could quite imagine a public building being erected without upper stories, where, in cases of panic, immense danger would ensue if the whole audience had to come from one end of the building to get out. Clause 4 of the Bill was, of course, the *crux* of the whole matter, and he had intended to allude to several points in regard to it, but after what had fallen from Dr. Longstaff it would be quite unnecessary. He only wished he could show him, and many other members of the Council, some of the buildings not very far from that spot, so that they might see and appreciate the immense difficulties architects had to meet with when they had to erect new buildings on old areas, and to appreciate also the improvement they were able to make in those buildings when they were put up. It was all very well to say, as Clause 30 did, that every person who erected a new building should leave a space at the back where the enclosing walls, or anything else, did not exceed 9 ft. in height, or in the case of other than a domestic building, 12 ft. They had frequently to put a building on an old area which was surrounded by walls which were 12 ft., 18 ft., and 20 ft. in height, and it was impossible to carry out the regulations. It was most important that there should be an open area in the rear of the building above the ceiling of the ground floor, but if the ground floor and basement of such building, used for business purposes, had an ample skylight in the rear and proper means of ventilation, it was more healthy than if the open area went right down to the ground and the back windows looked on a wall, the space thus becoming a receptacle for rubbish, and the air in it always stagnant. With regard to business premises, people did not live on the ground floors and basements. If they had open areas above the ground floor in the case of two or three buildings, each building got the combined effect of the light and air, and even in crowded districts they could put up buildings with a clear space in front of the back windows of 150 ft. or more. There was an almost unanimous consensus of opinion as to the impossibility of some of the regulations in the Bill, and he claimed for architects that they were practical men, actuated with as keen a desire as any member of the County Council to ensure healthy conditions for the people. He, therefore, asked the Council to consider the objections he had raised on those points of the Bill, and to endeavour either to give them up, or to put enabling clauses in, so that if they could not carry out exactly what was desired, they might approve of something which would undoubtedly improve the property as it now existed. With regard to the question of construction, it was impossible to go into all the points mentioned in the Bill, but he would plead for more discrimination being allowed to persons who had to carry out the regulations. In fact, he thought the Council would be playing into the hands of the speculating man if they put down strict and literal definitions of what they wished in matters of construction. Take the question of foundations. No architect would have a decided opinion upon the depth and width of the concrete under the footings of a building, unless he had first seen the ground; and do what they would, they could not meet all the cases they would have to deal with. With regard to the foundations, he held most strongly that the best orders they could give would be that no footings were to be placed under any new building until the District Surveyor had seen and approved the foundations. That would be on all fours with what was done in the case of drains by the vestries. The vestries now said, with regard to the laying of drains, that they should not be covered up until they were inspected, and he saw no reason why a competent District Surveyor should not say that he would not have the footings put in until more earth had been taken out. With regard to the walls, he believed, strictly speaking that, if the conditions of the Bill were read literally, they could not put a wall on a bressummer at all, and no doubt some modification would be made on this point. As to the tribunal for appeal, he strongly advocated such a tribunal in the paper he read some time back, and he could not help thinking that the abortive Act of 1850, which proposed that one legal assessor, and one architector or surveyor, should form a court, seemed a very good plan. But if they did not agree to that he would urge them not to make the Court of Appeal too cumbrous. They would get decisions, which were more to be relied upon, better with a tribunal of three than with one of five. The tribunal of appeal was a most important thing, but he hoped it would be slightly modified and that they would have a better tribunal even than five members would constitute. He would conclude by saying that they had now got the chance of having what he believed would be a thoroughly good Bill, and it behoved them all to try to do what they could to make it better. But with regard to the remarks which fell from Dr. Longstaff as to the reasons why the County Council were pushing the Bill forward rather hurriedly, he would venture to ask him to reconsider that. It was far better to wait one or two years and have a really good Act than that a Bill of this immense importance should be hurried through Parliament, and then that they should find, as had been found before, that they had to amend the Building Act again because they had left something out. If the County Council agreed to that, no doubt they might have a Bill which would be of immense advantage, both in respect to making London more sanitary in every way, and at the same time more beautiful. Mr. Slater concluded by moving a vote of thanks to Mr. Cates for having brought the matter before them so ably and so succinctly.

Mr. W. Bruce, as Chairman of the Housing Sub-Committee of the London County Council, thought it might be convenient to state to the meeting what were the considerations and experiences which had led them to press forward Part IV. of this Building Act. Mr. Cates had intimated that, in one or two respects possibly, they were visionary people, but they would be disappointed if they expected to find that he, the speaker, was a "dreamer of dreams," or anything of the kind. It was purely from practical considerations that it had struck them that the old Building Act failed so absolutely, when taken into consideration with legislation which had since come into force. Since 1889 two important Acts had been passed by Lord Salisbury's Government, the Housing of the Working Classes Act, 1890, and the Public Health Act, 1891, and, as a matter of everyday practice, he had found they clashed continually with the old Building Acts. Under the Building Act, a building might be erected, which the County Council might at once be compelled to destroy at the public expense, because it was an insanitary building under the other two Acts; and that was hardly a thing that should be allowed to continue. This was the main point he would call attention to, and was at the bottom of Part 4. As an illustration of what was going on under the Housing of the Working Classes Act, when the sanitary authorities declared that, through closeness or bad conditions, the houses within a certain area were dangerous to the health of the inhabitants, then the London County Council could be called upon to buy up the whole of that area, clear off the buildings, reduce it to bare land, reorganise new streets, and build houses again on those streets, either themselves, or by getting others to erect them. That was at the bottom of the whole thing. They had only to carry out the Acts recently passed, and the Building Act should be framed with a consideration for those Acts. Then the Public Health (London) Act, 1891, enacted that when a dwelling-house was dangerous and injurious to health the Local Authority could get a closing order; but in stepped the old Building Act, and said that the owner might rebuild it so as to make it a far more insanitary house than it was before, by raising it to five stories instead of two. Under the Housing of the Working Classes Act, 1890, an area of 15 acres in Bethnal Green had been notified, and the County Council had to buy up the whole of the interests in that ground. The original claims for compensation were £457,000, which, after much negotiation, were settled for £216,000, but the net loss to the people of London for the clearing of that area, after allowing for the value of the land as it stood, was 265,000*l*. Under the Building Act those unhealthy areas were growing up all over London, and the County Council could be called upon to destroy them at the cost of the people of London. That was the difficulty the County Council were in, for they had been called upon to consider no less than 70 areas, and the Building Act was actually producing that result over two-thirds of the metropolis. Several areas were now being cleared, at an immense cost to the people of London, therefore, he would ask whether they could not seriously consider as to some regulations being drawn up to prevent a recurrence of this absurd expenditure.

Mr. Campbell Douglas said that as he was seldom present at these meetings, it was a very interesting thing to find them in all the throes of a controversy which they in Glasgow had gone through, with a population about one-seventh of that of London, and with a great number of the difficulties which Londoners were now grappling with. These difficulties were, of course, several times increased in London, in quantity, if not in degree. There was one thing which struck him, and on which he might be pardoned making a remark, though he might be told, at the same

time, that it did not concern him. He did not see that there was any proper and clear understanding about money compensation to proprietors for the improvements proposed to be carried out, and that he considered should stand on the very forefront of the undertaking. A provisional order was intended to be got in Glasgow some ten years ago, against which he gave evidence as to its absurdity, the result being that the Sheriff of Lanarkshire eventually laid it aside and it was refused to be passed, as it was felt to be tantamount to confiscation to take ground from proprietors. Though a disciple of the Radical school, he would never think of taking any ground from a man without paying for it, and if this was not fairly gone about in the present case, the London County Council Bill would be shipwrecked by that alone. Allusion had been made as to the Art Committee giving the County Council the benefit of their advice and suggestion, and he understood that cornices were not to be allowed with over 24 in. projection. To his mind it was ridiculous to limit a thing in that way, it being a question which referred to the particular building the architect had in hand.

Mr. Hall, who was called upon by the President, moved the formal adjournment of the discussion till next Monday at 8 o'clock.

The President referred to the pleasure he had received in listening to the interesting addresses delivered by the members of the London County Council. He also expressed his gratification in finding, from the able and exhaustive address of Dr. Longstaff, that very material concessions were to be made on the part of the Council, in deference to what had been laid before them by the Institute. The meeting would be adjourned until that day week, and on Monday, April 9, a paper would be read by Mr. Thomas Blashill on "The Council Chamber and its Accessories."

The proceedings then terminated.

ARCHITECTS' BENEVOLENT SOCIETY.

THE annual general meeting of the subscribers and donors to the fund of this Society was held on Wednesday afternoon in the Council room of the Royal Institute of British Architects, Mr. W. Hilton Nash occupying the chair in the unavoidable absence of Mr. J. Macvicar Anderson, the President of the Society.

The annual report of the Council, read by Mr. Percivall Currey, the hon. secretary (*pro tem.*), was as follows:—

"The Council of the Architects' Benevolent Society have much pleasure in submitting their annual report of the progress of the Society during the past year, as both with respect to capital and income a considerable advance has been made towards that position of stability which it is desirable should be attained.

Advantage was taken of the necessity for reprinting the Red Book to bring the Society more prominently under the notice of those who had not as yet given it support. The Red Book, accompanied by a special appeal from the honorary treasurer, was accordingly sent to every member of the Royal Institute of British Architects, and to the profession generally throughout the country, in the hope that by thus making the Society better known, the funds at its disposal would be largely increased by the contributions of the more successful members of the profession, who might realise the great benefit which the possession of ample funds would enable the Society to confer on their less fortunate brethren who might become by affliction or misfortune fitting recipients of its aid.

It must be frankly confessed that the direct result of the labour and expense incurred in making this appeal did not realise the anticipations which had been formed, but there is reason to believe that much indirect effect has been produced which will in future benefit the Society. The financial result has been the receipt of 353*l.* 18s. in donations, and of new annual subscriptions to the amount of 62*l.* 19s.

As an instance of the possible result of individual exertion, the Council have pleasure in mentioning that one of their members obtained 50*l.* 8s. in donations and 8*l.* 8s. from new annual subscriptions. Apart from wishing to give expression to the Society's obligation to him, this is mentioned with the hope that other members of the profession may be induced to exert in like manner their personal influence to increase the funds of the Society.

With reference to the financial position of the Society, the statement of accounts shows that, including the payment of three pensions (70*l.*), a total amount of 467*l.* has been distributed among thirty applicants for relief (as against 410*l.* in 1892), while 170*l.* has been transferred from cash account income to capital account (as against 100*l.* in 1892). The income derived from investments was 279*l.* 6s. 9d., and from subscriptions 377*l.* 17s., the entire available receipts during the year 1893 being 779*l.* 1s. 7d.

By the investment of the legacy of Mr. John Gibson (500*l.*), together with donations and the amount transferred from the income account, the Council have been enabled to increase the Society's holding of 700*l.* Four per cent. Caledonian Railway Debenture Stock to 1,450*l.*; so that the entire investments now represent 8,050*l.* in Consols and Railway Debenture Stock, which have been purchased at a cost of 9,363*l.* 2s. 10d. and which are estimated at current market value at 10,375*l.*

It should be mentioned that it has recently come to the knowledge of the Council that the late Mr. J. H. Good bequeathed a sum of 100*l.* to the Society, subject to a life interest in his estate. In this connexion the attention of intending benefactors may be directed to the form of bequest printed at the end of the list of subscribers.

The Council, with great regret, announce the resignation of Mr. William H. White, as honorary secretary, in consequence of his greatly increased duties in connection with his position as Secretary of the Royal Institute of British architects. While making this announcement, the Council desire to place on record their high appreciation of the services which Mr. White has rendered to the Society, and their conviction that the progress made during his thirteen years' tenure of the office has been largely due to his active influence and energy.

As Mr. White's resignation took effect subsequent to the last annual general meeting, Mr. Percivall Currey kindly consented to undertake the duties of honorary secretary until the present meeting. He having expressed his willingness to devote his time and energy to the advancement of the interests of the Society, the Council have much pleasure in recommending his election to the vacant office.

Mr. R. Dircks, assistant librarian of the Royal Institute, has been appointed assistant secretary of the Society in place of Mr. Verity.

The following gentlemen, being the five senior members, retire, under the provisions of By-law 43, from the Council:—Mr. Fred. Chancellor, Mr. Rowland Plumbe, Mr. Augustus W. Tanner, Mr. H. H. Collins, and Mr. Thomas Harris. To fill the vacancies caused by these retirements and that caused by Mr. Percivall Currey's acceptance of the post of honorary secretary, the Council have the pleasure to nominate Mr. William Grellier, Mr. E. B. I'Anson, Mr. E. H. Martineau, Mr. T. M. Rickman, Mr. R. St. Aubyn Roumieu, and Mr. J. T. Wimperis, all of whom have consented to serve if elected.

The balance sheet and income account for the year ended December 31, 1893, audited by Mr. W. Kidner and Mr. W. Grellier, are herewith submitted.

The Council cannot close this report without expressing the obligations of the Society to the Royal Institute of British Architects for the hospitality afforded in allowing the Society the use of their rooms for the meetings, and for continuous acts of courtesy and kindness on the part of the Institute and its officers, which have materially assisted the business of the Society."

The hon. treasurer, Mr. Arthur Cates, read the statement of accounts and balance-sheet.

The Chairman, in moving the adoption of the report and accounts, said that, on the whole, they were very satisfactory. He thought it ought to be mentioned that it was owing to the energy of Mr. T. Harris that the sum of 50*l.* 8s., mentioned in the report, had been obtained. He was sure that they were all sorry to lose the services of Mr. White as their hon. secretary, for he had been so long connected with the Society that he seemed to have become part of it.

Mr. George Scamell seconded the motion, which was agreed to.

Mr. D. C. Nichols moved, and Mr. J. T. Wimperis seconded, a vote of thanks to the outgoing members of the Council, Messrs. F. Chancellor, Rowland Plumbe, A. W. Tanner, H. H. Collins, and T. Harris. This having been agreed to, Mr. G. Scamell moved, and Mr. H. L. Florence seconded—

"That the President of the Society be the President, for the time being, of the Royal Institute of British Architects, and that Messrs. W. Hilton Nash, J. G. Finch Noyes, Andrew Oliver, Charles J. Shoppee, Arthur Ashbridge, Thomas Blashill, J. Henry Christian, Sydney Smirke, Wm. Grellier, E. B. I'Anson, E. H. Martineau, T. M. Rickman, R. St. Aubyn Roumieu, and J. T. Wimperis be elected members of the Council."

The resolution having been agreed to,

On the motion of Mr. A. W. Tanner, seconded by Mr. Florence, cordial thanks were voted to Mr. Arthur Cates for his services to the Society, and he was unanimously re-elected treasurer.

Mr. Cates briefly replied.

Mr. E. B. I. Anson then moved, and Mr. L. Solomon seconded, that the thanks of the Society be presented to Mr. Percivall Currey for his services as hon. secretary during the past year, and that he be re-elected to that office.

This was agreed to, and Mr. Currey replied.

On the motion of Mr. Cates, seconded by Mr. Tanner, a vote of thanks to Messrs. W. Kidner and W. Grellier, the auditors, was agreed to.

Mr. L. Solomon then moved, and Mr. E. B. I'Anson seconded, that Messrs. T. Harris and G. Scamell be elected auditors for the ensuing year.

The motion having been agreed to,

Mr. Cates proposed a vote of thanks to the Royal Institute of British Architects for affording office accommodation to the Society.

Mr. Currey seconded, and the motion was agreed to.

Mr. W. H. White replied on behalf of the Institute.

On the motion of Mr. Scamell, seconded by Mr. Tanner, a vote of thanks was passed to the Chairman, and the proceedings terminated.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held at the County Hall, Spring Gardens, on Tuesday, Mr. A. Arnold presiding during the earlier part of the proceedings.

Election of Officers.—The first business of the sitting was the re-election of Messrs. John Hutton, Charles Harrison, and W. H. Dickinson to the offices of Chairman, Vice-Chairman, and Deputy-Chairman respectively. Committees for the ensuing year were also re-elected.

Paving and Sewer Works, Boundary-street.—The adjourned report of the Public Health and Housing Committee relating to this matter was considered. The report was as follows:—

"The plan for the laying-out of the Boundary-street area having been formally approved of by the Home Secretary, it becomes necessary to decide what materials shall be used for paving the new streets. The engineer has submitted to us estimates of the cost of paving, including the provision of trees and the formation of sewers. They are as follows:—

Paving carriageways with wood and footways with York stone (including trees and sewers)	£44,200
Paving carriageways with granite cubes and footways with York stone (including trees and sewers)	51,800
Paving carriageways with asphalte and footways with York stone (including trees and sewers)	54,800
Paving carriageways with macadam and footways with York stone (including trees and sewers)	37,000

"We have at once dismissed from our minds any idea of macadam, it being noisy, dusty, dirty, and expensive to maintain. We consider that either wood or asphalte should be used, as there is not likely to be enough vehicular traffic through the area (except in the new street between High-street, Shoreditch, and Boundary-street, which includes the site of Calvert-street, and with which we deal in another paragraph), to make granite blocks desirable, and asphalte is the most suitable from a sanitary point of view, as it can be easily cleansed. Although there will be considerable yard space to the blocks of dwellings, yet we consider that the streets being quiet will be largely used by children, and, in view of the fact that wood becomes readily contaminated by horse droppings and retains moisture for some time, it is not so suitable in our opinion as asphalte. We have hesitated before recommending so expansive a paving, but after duly weighing the advantages of asphalte as against the increased cost, we recommend—

"'That the carriage-ways in the area comprised in the Boundary-street, Bethnal-green, scheme (with the exception of the proposed road between High-street, Shoreditch, and Boundary-street) be paved with asphalte when the buildings are erected, and the footways with York stone, and that the engineer be instructed to prepare plans and specifications accordingly.'"

Mr. Antrobus moved that the recommendation be referred back, with an instruction that wood and not asphalte should be used.

Mr. Marsland seconded, but the amendment, on a show of hands, was lost, and the recommendation of the Committee agreed to.

Electric Lighting of the Victoria Embankment.—The following adjourned report of the Highways Committee was next considered:—

"The Council on February 13 referred back to us, for further consideration and report a recommendation which we then submitted with reference to the laying of the conduits and the formation of refuges around the lamp columns in connexion with the electric lighting of the Victoria Embankment, objection having been raised to the proposal to place the columns in the centre of the carriage-way.

"We may state that when the subject of the electric lighting of the Embankment was first before us, we gave very careful consideration to the question of the position of the lamp-columns; and in our report to the Council on June 21, 1892, we stated that we proposed 'that lamps of from 1,000 to 1,200 candle-power should be placed in the centre of the road at about fifty yards from each other.' The Council adopted our recommendation at the

following meeting, an amendment to refer it back to us 'for further consideration, especially on the point of the distribution of the lamps,' having been rejected.

We think it well now to give some of the reasons upon which we based our opinion that the best arrangement for lighting the Embankment is for the lamps to be placed in the centre of the carriageway. If the electric lamps were to be placed along the kerb on each side of the carriageway it would be necessary either *(a)* to use very lofty columns for the lamps, or *(b)* to cut the trees in order to allow of the lamps being fixed in the desired positions. Should the former alternative be adopted, the trees would still veil the light from large portions of the road and footways, while the adoption of the second would involve a mutilation of the trees, which would greatly detract from the picturesque appearance of the Embankment. In some of the Continental cities the lamps are suspended by means of wires or cables; and this method necessitates the placing of standards in the carriageway to support the wires, except in the case of narrow streets, where other means are adopted. Should these necessary supports be placed on the Embankment against the kerbs, the span would be so great, on account of the width of the carriageway, that the lamps would be unsteady in the slightest breeze, and this would seriously diminish the effectiveness of the light. Owing to the width of the road it would be almost impossible, and certainly unadvisable, to erect arches or fix girders on standards for the purpose of carrying the lamps.

Having again given very careful consideration to the matter, we have come to the conclusion that the least objectionable and the most advantageous method of distributing the light over the Embankment will be by the erection of ornamental lamp columns, each with a small refuge round it, not exceeding 4 ft. in width, in the centre of the carriageway. This is at no part less than 64 ft. in width from kerb to kerb, and there would be left on each side of the refuges a space of 30 ft. We see no reason for altering the recommendation which was referred back to us on February 13, which accordingly we again submit, as follows—

'That, subject to an estimate being submitted to the Council by the Finance Committee, as required by the statute, the work of laying the necessary conduits and the forming of the refuges round the lamp-columns in connexion with the electric light installation for the Victoria Embankment, &c., be carried out by the Council without the intervention of a contractor; and that the plans, specification, and estimate be referred to the Works Committee for that purpose.'"

Mr. Roberts moved an amendment to the effect that it was undesirable that lamp columns should be placed in the centre of the roadway of the Embankment. It was absolutely unnecessary to light the Embankment in the manner proposed, and if they did so it would show that they had no sympathy with the architectural beauty of London.

Mr. J. W. Benn, M.P., seconded the amendment, which was supported by Mr. John Burns, M.P., Mr. Beresford Hope, and others, and ultimately adopted.

Wellington-street and Strand Widening.—The Improvement Committee reported as follows—

"Some time back the Strand District Board stated that the premises at the corners of Wellington-street at its junction with the southern side of the Strand were about to be pulled down, and suggested that the Council should avail itself of the opportunity thus presented for widening the Strand and Wellington-street. We are not prepared at present to deal with the setting back of the *eastern* side of the street, but we propose to confine this report to the property on the *western* side.

Wellington-street at its junction with the Strand is at present about 64 ft. wide, and the Strand at this point has a width of about 68 ft. Owing to the inadequate width of the road the traffic is frequently congested, and we feel confident that the Council will be ready to entertain any proposal for remedying this at a moderate cost. We have ascertained that the property required for setting back the western side of Wellington-street to the line of Lancaster-place and for rounding the corner at the junction with the Strand is the freehold of the Duchy of Lancaster, and that most of the leases will fall in at Christmas, 1896, others in 1903 and 1918, and one in 1931. The Duchy is willing to sell to the Council, subject to the existing leases, the reversion to the freehold of this property, containing an area of 7,219 square feet. By adding the land to the public way the width of Wellington-street between the Strand and Lancaster-place would be increased to about 100 ft., and the Strand between Wellington-street and Savoy-street would be at least 80 ft. wide. The price asked by the Duchy is 32,000*l.*, and the following conditions are attached to the offer:—'*(a)* As the valuation of the Duchy's interest has been made on the assumption that the money will be paid on March 25 next, interest at 4 per cent. per annum from that date until actual payment will be required. *(b)* Immediately any of the pieces of land come out of lease, or the buildings or parts of buildings on such piece of land are previously removed, the Council shall add such piece of land to the public thoroughfare, and shall at the expense of the Duchy form, under the new footway and in accordance with the regulations or requirements of the local authority, such vaults or cellars as the Duchy may require for use in connexion with the buildings on the adjoining Duchy land, and shall assure the free use of such vaults or cellars to the Duchy in perpetuity. *(c)* Immediately the piece of land at the corner of Savoy-street and the Strand comes out of lease, or the part now standing thereon of the house now numbered 125 in the Strand is previously removed, the Council shall, at its expense and to the satisfaction of the surveyor general of the Duchy, build on the new line of frontage a new north wall for the residue of the said house. *(d)* The Duchy shall not be liable to see to the performance of any covenant on the lessee's part contained in any of the existing leases, or be under any responsibility to the Council with respect to any building or part of a building included in the sale to the Council. *(e)* No claim or question of "betterment" in respect of this particular improvement shall be raised by the Council as to any part of the block bounded by Wellington-street, the Strand, Savoy-street, and Lancaster-place, which might be held to be affected by the contemplated improvement.' We consider these terms favourable to the Council, especially when it is remembered that the Council will be saved all outlay for compensation in respect of leasehold and trade interests, and will only have to pay the value of the land to be added to the public way. The estimated cost of the paving works is 2,700*l.* The widening of Wellington-street will have to be undertaken at some time, and we are convinced that it can never be done so inexpensively as at present. Having regard to the very favourable opportunity now presented for effecting this much-needed improvement at the least possible cost, we recommend—

'That, subject to an estimate being submitted to the Council by the Finance Committee as required by the statute, the Council do accept the terms and conditions of the Duchy of Lancaster for the reversion to the freehold of the property required for widening Wellington-street and the Strand, and do carry out the improvement as shown upon the plan submitted with this report; and that the solicitor be instructed to prepare the necessary agreement with the Duchy.'"

The consideration of the report was postponed.

A Ground Plan of London.—It was resolved to spend a sum not exceeding 500*l.* as a preliminary step towards the preparation of a ground-plan of London, showing the various freehold interests.

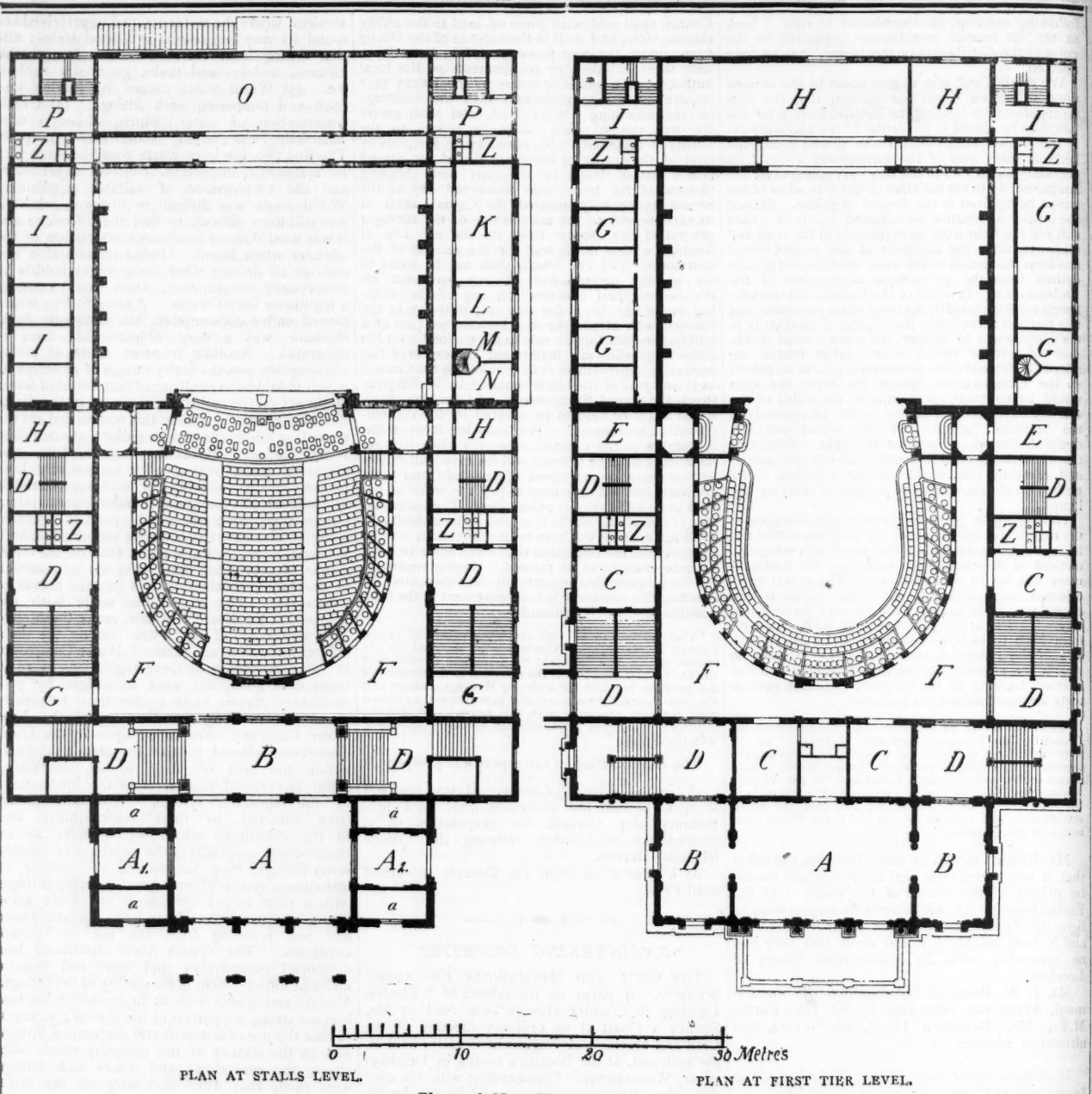
At a quarter to eight the Council adjourned until Friday.

ENGINEERING SOCIETIES.

THE CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—A paper on the subject of "Electric Lighting in Country Houses" was read by Mr. Sydney à Court at an ordinary meeting of the Civil and Mechanical Engineers' Society, held on the 15th inst. at the Society's rooms in Delahay-street, Westminster. Commencing with the consideration of the various sources of power suitable for generating electricity, the author referred to an interesting installation at the private residence of Mr. H. C. Brush, in America, where a self-regulating windmill is in use charging a huge battery of storage cells. Motive power derived from water, gas, and oil engines was discussed; and attention drawn to the necessity for the proper training of the electrician in charge of works, who although, as a rule, in sole charge of plant and apparatus costing from 1,000*l.* is often not paid more than thirty shillings a week, while his want of knowledge or carelessness in attending to the storage battery alone—an expensive item—may occasion its loss in a very short time. The design of small installations was next considered, and stress laid upon the necessity of their being under the control of a consulting engineer, who, by his independent position and freedom from connexion with manufacturers and contractors, is able to consider each case strictly on its local requirements and conditions. Examples of the annual cost and working expenses of small installations were given, and attention drawn to the advisability of using incandescent lamps of high efficiency, as the doing so effected a considerable economy in the yearly cost of working.

THE INSTITUTION OF CIVIL ENGINEERS.—At the ordinary meeting of this Institution on the 13th inst., Mr. Alfred Giles, President, in the chair, a paper was read dealing with "The Prevention and Detection of Waste of Water," by Mr. Ernest Collins, M.Inst.C.E. Waste of water, said the author, comprised—(1) Visible waste above ground, caused by defective mains or pipes, or by unsound and unsuitable house-fittings. (2) Hidden waste, arising from broken pipes underground, or from faulty mains and services, where the water escaped unperceived and found its way into sewers or disused drains; also that arising from secret overflows from baths, cisterns, underground tanks, gas-engine coolers, &c. (3) Wilful waste caused by leaving taps open and tampering with fittings. (4) Undue consumption of water, which, although used wastefully, was serving some useful purpose. The first two kinds of waste could be dealt with by systematic inspection, constant supervision, and the employment of suitable appliances. Wilful waste was difficult to discover, whilst it was still more difficult to find the offender; and it was most difficult to obtain a conviction of the offender when found. Undue consumption was difficult to define; what some might hold to be unnecessary consumption, others would consider a legitimate use of water. Among fittings which caused undue consumption, the automatic flushing-tank was a very objectionable form of apparatus. Another frequent cause of undue consumption was the faulty design of closet-pans, which should be so constructed that the jet of water might act on the soil to be displaced in the direction of the outlet. Where this was carried out the regulation allowance of two gallons at each flush would suffice. Hydraulic motors, lifts, and elevators, when worked off comparatively low-pressure mains suitable for ordinary domestic or trade supply, occasioned undue consumption. Ornamental fountains and careless garden-watering also gave rise to undue consumption and, in some cases, wilful waste. One of the chief means of preventing waste was the introduction of thoroughly efficient fittings into the houses of consumers. The regulations made with the approval of the Board of Trade, under the Metropolis Water Act of 1871, were among the main difficulties which embarrassed Water Companies in London. Many of these regulations were in themselves good, but were so hedged by precautionary clauses as to render them frequently abortive. In 1883 the directors of the New River Company were called upon by the Local Government Board to transfer certain districts within the area of their supply, containing about 22,000 old houses, from the intermittent to the constant system. Attention having been directed to their responsibility and to the difficulties which would have to be encountered, especially in the provision of suitable water-fittings, they empowered the author to introduce a system of testing and stamping fittings, with a view to aid consumers to obtain good fittings and to protect them from the annoyance and loss resulting from the use of inferior apparatus. The system then introduced had developed extensively; and there had been a material improvement in the quality of the fittings. Manufacturers who were at first antagonistic had become strong supporters of the system; so much so that the use of untested and unstamped fittings was, in the district of the company mentioned, almost the exception; and where such fittings were used, they were invariably of the same strength and proportions, and in accordance with the regulations adopted by the company. The Deacon waste-water meter was that most generally in use; it was compact, easily regulated, and fulfilled generally the requirements. The waste-water meter enabled an inspector to see at a glance the precise locality in any district where waste was taking place. The expense of the introduction of the system was considerable—the author's experience showing that, in many districts in London, it involved an outlay of about 150*l.* for every 1,000 houses so controlled. This sum included the cost of the meters and of fixing them on a by-pass, with sundries incidental to the fixing of valves for isolating the divisions of the district. In laying out districts for the waste-meter system, care should be taken that the district to be controlled by the waste-meter was not too large. The author had found from experience that a 4-in. Deacon meter could well control about 400 to 500 houses; but districts smaller than this were desirable. The author proceeded to describe in detail the system adopted by him for the efficient working of the waste-water meter system. By means of this system he had, dealing with an estimated population of 87,000 in Shoreditch, effected in the course of three years a diminution of waste and undue consumption amounting to 720 million gallons per annum.

GOOD FRIDAY WEEK.—Next week we go to press a day earlier than usual. All communications for the Editor should reach him by *first post on Wednesday morning*, except lists of tenders, which will be received up to 10 a.m. of the same day.



PLAN AT STALLS LEVEL. PLAN AT FIRST TIER LEVEL.

Plans of New Theatre, Rotterdam.

REFERENCES.

PLAN AT STALLS LEVEL.

A. Vestibule (road level)
A1, A2. Side lobbies (road level).
a, a. Box and Ticket Offices (road level).
B. Inner Hall (road level).
D. Staircases.
F. Passages.
G. Cloak-rooms.
H. Retiring-rooms (to boxes).
I. Dressing-rooms.
K. Green-room.
L. Library.
M. Stage Manager (German opera.)
N. Stage Manager (Dutch play).
O. Store-room.
P. Staff staircases.
Z. Lavatory.

PLAN OF FIRST TIER LEVEL.

A.B. Foyers.
C. Cloak-rooms.
D. Staircases.
E. Retiring-rooms (to boxes)
F. Passages.
G. Dressing-rooms.
H. Store-rooms.
I. Staff staircases.
Z. Lavatories.

Illustrations.

THE CONSISTORY COURT, CHESTER CATHEDRAL.*

AT the western extremity of the south aisle of the Cathedral is the broad base of a contemplated tower, begun not very long before the Reformation, but never completed. This is now used as the Consistory Court of the Diocese; the view represented is from the aisle, to show the picturesque entrance and Jacobean ornament, bearing the date 1636 in front of the central finial. Through the open door are seen the quaint oak Jacobean fittings, comprising a massive square table, about 9 ft. by 8 ft., surrounded by the proctors' seats within a panelled enclosure which forms the backs. In front, immediately under the west window, is the Chancellor's seat raised on a platform about 2 ft. above the floor, having a very richly-carved back and canopy. A peculiar feature is the chair perched high up on the angle of the panelled enclosure; when the Ecclesiastical Courts had jurisdiction over the moral conduct of the citizens this was the delinquent's seat; it is now supposed to be the witness's chair, but never used. The Court is lighted by large perpendicular windows on the south and west sides, and here, under the Presidency of the Chancellor of the Diocese, faculties are decreed for structural alterations required in the parish churches of the Diocese, and questions in Ecclesiastical law decided.

The Consistory Court was formerly held in the Lady Chapel at the east end of the Cathedral.

* This is the correct title of the plate: by an inexplicable mistake of the lithographer the title of another drawing by Mr. Ivison, recently published by us, has been affixed to this plate. The proof was passed by the Editor with the correct title on it.

ROTTERDAM THEATRE.

THE new theatre at Rotterdam has to be alternately at the disposal of an operatic and a dramatic company, who both have their offices in the block. The building was erected from the designs of Mr. J. Verheul, of Rotterdam, to fulfil the requirements of these two classes of play, a somewhat difficult problem, as the *finesse* of a tragedy or comedy is generally lost in an opera auditorium, in the same way as the actual scenery requisite for a dialogue is lost behind a proscenium built to frame a full opera with its ballet. The building had the advantage of an open site, allowing of essentially symmetrical planning, and the funds were forthcoming to make the building "monumental" in construction and design. As in the case of Mr. Baes, the architect of the Brussels Theatre, Mr. Verheul was to a great extent able to take such initiative as he considered advisable for ensuring the safety of those who were to use his building and, as has been generally the case abroad since the Ring Theatre fire, the proprietors entered heart and soul into the effort to make the building a model one.

In examining the plans of Mr. Verheul's theatre we should remember that they actually date from 1883, as the foundations of the building were laid in 1884. This is, hence, a good deal earlier than the Paris Opera Comique fire, which had so much influence on the latest examples of theatre planning. In 1883 there was only the commencement of that movement which the Vienna fire occasioned, and theatre architects and public bodies had only began to realise their responsibilities. As dating from that period, there is little doubt that the plans were far above the average.

The plans we illustrate of the *entresol* and the first tier level practically explain themselves, but, as we are not reproducing one at ground level, it would be well to supplement the former with some remarks on the main entrance. There is a carriage approach to the front from which the main vestibule *A* can be reached by passing three sets of double swing doors and ascending a few steps. This vestibule can also be reached by foot passengers coming up from either side. These, then, have to first pass the small outer lobbies (*A*, *A2*) to the right and left. There are four box offices (*a a*) in the vestibule, two each for the managers of the German Opera and the Dutch plays, each administration having a separate day box office and a ticket office for the hour prior to the performance. These are not the only ticket offices, as there are two for the lobbies of the staircases to the third and fourth tier respectively. No unreserved "pit" having been arranged for, the offices in the main vestibule only have to supply tickets for the different classes of stalls and the first and second tiers. No part of the auditorium can be entered on the vestibule level, some fifteen steps having to be mounted to reach the stalls or *entresol* floor.

On referring to the last-named plan, it will be seen that the stalls with the lowest row of boxes have their own staircase on either side of the broad passage which runs round the auditorium, and have no direct communication, as one would almost expect, with the grand staircase leading from the vestibule to the first tier and its *foyers*. This, it is true, keeps the separate sections of the audience well apart in case of a hurried exit, but we do not think there would have been much extra risk if the lower floor had the use of the four staircases. The number of seats in the first tier is comparatively small, whilst there are some 460 on the stalls level. What will first strike an Englishman is that the stalls should be so high above street level. This is, of course, due to there being no possibility to sink the stage cellars well below the street level excepting at a great expense. As will be seen from the section, the building had to be put on piles.

Referring to the first tier plan, we may call attention to the extensive *foyers* which have been provided for the use of the part of the audience on this tier and in the stalls. The communication between the stalls and the first tier is by means of a continuation of the two stalls staircases mentioned above. What with the spacious passages the playgoer will, indeed, have sufficient room for an *entr'acte* stroll. In front of the *foyer* there is also a roomy balcony which he can use in the summer.

The plans of the other tiers practically repeat themselves, and even the gallery has been provided with a large *foyer*. As in the case of the *foyers* on the first tier, this room is provided with a bar for light refreshment.

The seating capacity of the building is not very large, the total being 1,257. The floor of the house, together with its boxes, has 468 seats, the first tier 225, the second 164, and the third 400. The average width of the seats is 56 centimètres, or 22 in.

As to the "back of the house" we would only note that all the main structural parts of the stage machinery and fittings are of iron. The stage measures 18 by 25 mètres, or 59 ft. by 82 ft., and has a proscenium opening of about 11 mètres, or 36 ft. square. The latter is protected by an iron curtain which can be closed in 45 seconds.

The building is heated throughout by hot water. The illuminant is gas, for which there are more than sixteen hundred burners. There are more than thirty hydrants in the building, and some eighty emergency oil lamps have been distributed in the passages, staircases, &c.

The elevations are in brick and free stone, Italian Renaissance (or what is called so in Germany) being the style adopted. M. Marqui, of Brussels, is to some extent responsible for the interior decoration, and Herr Rosenberg, the engineer at the Cologne City Theatre, designed the stage machinery. We understand that M. J. Verheul has, since the completion of the Rotterdam Theatre, prepared the designs for the proposed new theatre at The Hague.

MICROSCOPIC STRUCTURE OF ROCKS.

THESE reproductions from sections of stone as seen under the microscope are introduced as illustrations to the Student's Column of this week (see page 220), and are referred to and explained there.

COMPETITIONS.

CONGREGATIONAL CHURCH AND SCHOOLS, NORTHAMPTON.—The competition for the new Congregational Church and Schools, Kingsthorpe-road, Northampton, has resulted in the plans of Messrs. Mosley & Anderson, of Northampton, being adopted.

WORKHOUSE QUESTION, STOCKPORT UNION.—On the 12th inst., at a meeting of the Board of Guardians of the Stockport Union, the Chairman, Mr. C. Earnshaw, presiding, the question of workhouse extension was considered. Mr. J. Williamson proposed that the selected competitive plans, on which the Board had paid a premium of 300*l.*, be sent to the Local Government Board for approval or otherwise, and that the architect to the Local Government Board be asked to come down and advise the guardians. These plans would involve spending 40,000*l.* on the site of the present workhouse at Shaw Heath. A strong feeling prevailed, he said, that it would be better to build an entirely new workhouse on another site. Mr. J. Rowcroft urged that the plans to which the second premium of 100*l.* was awarded be also sent, inasmuch as the cost of carrying these into effect was estimated at 10,000*l.* less. After voting on several amendments, the Board instructed the Clerk to send to the Local Government Board for approval or otherwise the first and second sets of the competitive plans.

BATH PUMP-ROOM EXTENSION.—The Baths Committee have at length, says the *Bath Chronicle*, made a step forward in regard to the Pump-room Extension Scheme, and there is some prospect of the work being taken in hand. At all events the Committee have met Mr. Brydon, the architect, in consultation with Mr. Waterhouse, and Mr. Brydon has received instructions to prepare and submit to the Committee a sketch plan on lines less pretentious than those followed in the competition. Special attention will of course be given to the covering of the great Roman Bath, and one feature of the design will in all probability be a balcony all round it, but preserving untouched the piers and other remains of its ancient grandeur. The elevation of the building in the churchyard will be only one story, the Concert-room will not be the prominent feature it was in the original plan, and the other accommodation will not be so extensive as was at first proposed.

ARCHITECTURAL SOCIETIES.

CARLISLE ARCHITECTURAL, ENGINEERING, AND SURVEYING ASSOCIATION.—At a meeting of this Association, held on the 7th inst. in the Town Hall, Mr. C. W. Hill, sanitary inspector, delivered a lecture on "The Sins of the Jerry Builder and their effects on the Public Health." Mr. C. Lonsdale presided. Mr. Hill commenced by defining the meaning of "jerry builder," and where and how he flourishes, and said his victim is, as a rule, the working man who has saved enough money to buy a house of his own, and is led to believe that he is making a bargain by purchasing his dwelling from such a builder for a few pounds less than a proper house could really be built for. The lecturer pointed out many of the devices practised by the "jerry builder" to economise in the erection of a house, notably those of bad foundations, hollow walls, filled in with earth or rubbish, hollow chimney-breasts, causing smoky chimneys, no flashings to roof, wall plaster made of street sweepings, &c., floors laid on the bare earth, and defective house drains, in which the ingenuity of the unscrupulous builder is seen to such advantage by the use of bad pipes and cheap fittings, &c. He spoke very plainly on the importance of efficient house drainage and plumbing to prevent the escape of sewer gas, so conducive to the contraction of typhoid fever and diphtheria, and said he was of opinion that not 10 per cent. of the drains laid up to ten years ago in Carlisle would now stand a proper test. The lecture was illustrated by a large number of coloured drawings, some of them showing a remarkable state of defective drainage, and the lecturer pointed out the necessity of a rigid and constant supervision by a public inspector of all buildings while in course of erection. A hearty vote of thanks was accorded Mr. Hill at the conclusion of his lecture.

ARCHITECTURAL SECTION OF THE GLASGOW PHILOSOPHICAL SOCIETY.—Mr. P. Macgregor Chalmers, F.S.A., Scot., lectured on "The Development of Architecture as Exhibited in Scottish Abbeys and Cathedrals" to the Architectural Section of the Glasgow Philosophical Society on the 5th inst. The subject, he said, was one he had studied for a quarter of a century, and the only reliable guide was the art itself, as dependence on local tradition, carvings, charters, coats of arms and such like, led to error. This had been shown in the case of Glasgow Cathedral, where the central tower was recorded to have been built by Bishop Robert Wishart, the truth being that it was the north-western tower for which he was responsible. In the same structure a coat of arms had led antiquarians to ascribe the lower story of the south transept to Archbishop Blackadder, whereas it was in reality the work of the thirteenth century. Lime-light views were shown illustrating the progress of the art from the church of St. Regulus at St. Andrews in the middle of the eleventh century to the sixteenth century, when Gothic art gave place to the Renaissance.

GLASGOW ARCHITECTURAL ASSOCIATION.—The annual business meeting of this Association was held in the rooms, 114, West Campbell-street, on the 6th inst. The reports submitted by the Committee and the Treasurer were read, and showed the Association to be in a satisfactory condition, both as regards membership and financial affairs. The reports being approved, the office-bearers for the coming session were elected. They are as follows:—Hon. President, Mr. William Leiper, A.R.S.A.; President, Mr. A. N. Paterson; Vice-President, Mr. W. Tait Conner; Hon. Secretaries, Mr. John White and Mr. Walter R. Watson; Hon. Treasurer, Mr. William Fraser; Hon. Librarian, Mr. Alexander M'Gibbon; Committee, Mr. Hugh Dale, Mr. Robert J. Gildard, Mr. J. E. Potts, and Mr. Andrew Robertson.

EDINBURGH ARCHITECTURAL ASSOCIATION.—On the 7th inst., at a meeting of the Edinburgh Architectural Association in the Royal Institution, the President, Mr. W. W. Robertson, referred to the death of two members—Mr. A. Heiton, Perth, and Mr. Simpson, Leith, and it was agreed to record the Association's deep regret at the decease of these gentlemen. The Chairman also referred to their deputations to the Town Council on the subject of the proposed New North Bridge, and to the points which had been laid before the Corporation. Mr. Thomas A. Croal, F.S.A. (Scot.), then read a paper entitled "The Man in the Street—a Non-Professional View of Architecture." The lecturer passed in review various features in architecture as they impressed an unlearned person. The laborious plan of building up streets on cellars whose object was to create underground apartments, once so largely in use in Edinburgh, was noticed with its application to public buildings. Mr. Ruskin's remarks on a building in Edinburgh were quoted in a criticism of inappropriate detail, and certain churches stopped in their design by foundation reasons were referred to. The emblems of eternity on the façade of the slaughter-house was mentioned as a curious solecism. The interior of a house was next dealt with, and this question was asked, why all rooms should be mere rectangular boxes, a house near the place of meeting being described with round, oval, and recessed rooms. Proceeding to treat of entrances and exits, the faultiness in this respect of a number of public places in Edinburgh were next referred to, and the last subject treated was that of bridges, the North Bridge question being taken up, and the hope expressed that the new bridge would not be placed in the hands of an engineer, as when it was widened in its first form it had at least fine proportions, but it was difficult to understand what was the mental condition of the Town Council who approved of the alteration of twenty years ago. The speaker then asked if the members were prepared to submit to the half-century-old gibe of the Camden Society, that "if we must be utilitarian we shall never be good architects." He was persuaded the Association would not, and that, if only the opportunity were afforded, there would be found architects who could so apply old principles to new needs, that a bridge, at once strong and stately, graceful and artistic—and perhaps economical—would be provided to displace the ugliness of to-day, and to adorn the grand site the bridge occupied. At the close a hearty vote of thanks was accorded to Mr. Croal for his paper.

GLASGOW SCHOOL OF ART.—The course of lectures by Mr. William J. Anderson on the Architecture of the Renaissance in Italy was brought to a close on the 7th inst., when it was intimated that a similar series by Mr. Alex. McGibbon, on "Gothic Architecture," was arranged for next winter, as well as another course dealing with advanced problems of building construction. In briefly reviewing the session's work in introduction, the lecturer stated that the

Italian revival, like other revivals in Art and Architecture, took rise in bold and original work inspired by the prototype, but mixed with a good deal of what was current, and thereafter ran a course of closer approximation to that pre-existing type till something like literal reproduction was reached, rules prescribed, and the revival finally robbed of its vitality. Another characteristic tendency also observable in such a movement as the English Gothic revival was that the latest periods of the old work were first seized upon by the revivalists, who thereafter inclined more and more to adopt earlier treatments. Thus the Italian Renaissance architecture, originating in the work of Brunelleschi and others who were inspired by a study of late antique Roman, gradually inclined to imitation of the style of Augustus' time and ended in the almost Grecian work of Palladio. "Palladian Architecture and the Decline" formed the special subject of the concluding lecture, the chief part of which was devoted to an analysis and criticism of nearly all Palladio's works at Vicenza and Venice which were fully illustrated by lantern views and diagrams. Although in England his name had attained a fictitious importance relatively to several earlier masters and his talents were buried in inferior material, generally his work showed good taste, a fine sense of proportion, and no little originality in composition. The works of his contemporary Vignola were shown in comparison, as well as those of other architects of the later period in Rome, Genoa, and Venice, the most active centres of the time. The causes of decadence were manifold, but at least two tendencies of the kind are clearly distinguishable in the work itself. First, that of the purists, such as Vignola, Palladio, and Serlio, bound a little too firmly to ancient usages and the measurements of Vitruvius, the results being the coldness and formality that was common to their work and teaching. Coeval with this, but outlasting it, and of wider and more disastrous influence, was the tendency due, in the first instance, to Michelangelo. In the hands of his imitators the traditional use of architectural features and detail was misunderstood or purposely misapplied, and uncontrolled freedom was indulged in these without regard to their proper application.

NORTHERN ARCHITECTURAL ASSOCIATION.—The annual selection of drawings in connexion with this Association, including those which have gained prizes in connexion with the Royal Institute of British Architects, were placed on view in the art section of the Art Gallery, Newcastle, on the 13th inst.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The ordinary meeting of this Society was held at the School of Art on the 13th inst., Mr. C. M. Gibbs presiding. After announcing, in touching terms, the sudden decease of their late Vice-President, he moved the following resolution, which was seconded by Mr. F. Fowler, and passed in silence, the members expressing approval by rising from their seats:—"That the President, Council, and members of the Sheffield Society of Architects and Surveyors desire to express their sincere sympathy with Mrs. Mitchell-Withers, Mr. J. B. Mitchell-Withers, and the family, in the sore bereavement they have sustained by the death of the late J. B. Mitchell-Withers, F.R.I.B.A., F.S.I., whose relations to members of the profession generally were always so kindly as to have not infrequently ripened into personal friendships. His able and honourable practice commanded the respect alike of the public and of the profession, and maintained its highest traditions; his devoted and successful performance of public duties reflected credit on his profession; and his services in the formation of the Society and in its management as a member of the Council, and as Treasurer and Vice-President with his lectures, are recorded and most gratefully remembered, and the Society desire to express their deep sense of the great loss they have sustained."

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—On the 7th inst. a meeting of this Association was held, Mr. Allan Wyon, F.S.A., in the chair. Mr. Earle Way described some remarkable finds which have recently been made at Southwark, near the site of the old Marshalsea Prison. On a former occasion, the discovery of a great many piles on what was once marshy ground had been reported. More recently, a great many flint implements of the neolithic period have been found, with evidences of manufacture on the spot, these being in a thin bed of sand below the later accumulated soil. Mr. Loftus Brock, F.S.A., spoke of the evidences, brought to light at various times in past years, of the discovery of piles, as if associated with lake dwellings, in various parts of Southwark. Mr. de Gray Birch, F.S.A., exhibited a squeeze from a Roman altar at Schloss Fürstenau, Hesse Darmstadt, dedicated to Diana, by Vitales. The Rev. J. Cane-Browne exhibited a silver Royalist badge, cast and partially engraved, which had been preserved by his family for several generations. A paper was then read by the chairman on some additions to what is known relative to some of the great seals of England, and photographs of several examples were exhibited. It was shown that, although Edward III. renounced for a time the title of King of France, nevertheless, the fleurs de lys of France still appeared on the great seal. By inspection of a deed in the Augmentation Office, the engraving of Queen Elizabeth's second seal, used in 1587, is proved to be the work of Nic. Hilliard, and he was granted a lease of certain property for twenty-one years in consideration of his having done so. Some curious particulars were rendered with respect to the want of a great seal by Parliament, during the Civil Wars, when the great seal of England was with the King. Charles II., when in considerable monetary difficulties, ordered the making of seals, and some unpublished documents were referred to. The existence of a hitherto unknown fourth seal of Charles II. was proved, there being minute roses in the field. It is used on and after 1673, but there seems to be no existing record why the previous seal was discarded for the insertion of the roses. A second paper on Repton Church could not be read owing to the lateness of the hour.

Correspondence.

To the Editor of THE BUILDER.

ELECTION OF FELLOWS, ROYAL INSTITUTE OF BRITISH ARCHITECTS.

SIR,—I feel indignant at the result of the voting for the election of Fellows, *i.e.*, the rejection of candidates, brought about by a clique of members, who have inflicted a cruel wrong upon six professional men recommended for election by the Council. Personally, I can testify to the trouble the Council took to satisfy themselves as to qualification for candidature.

Presuming that there were one or two candidates who were distasteful to the clique, is the wholesale rejection of approved candidates justifiable simply because they were not Associates? If this qualification is to be the *sine quâ non*, let the Council so inform intending candidates and prevent disappointment and waste of time. The mine has been sprung, in my opinion, in a cowardly manner. The by-laws do not provide that candidates for the Fellowship should necessarily be Associates. The result of the proceedings has, in my opinion, damaged the prestige of the Institute and its Council.

THOMAS BATTERBURY,
Fellow (elect) R.I.B.A.

March 14, 1894.

The Student's Column.

THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—XI.

MICRO-STRUCTURE OF ROCK-FORMING MINERALS (*continued*).

AN abundant mineral, entering into the structure of many building stones is *Mica*.—Of this there are several varieties, but we need only mention two—biotite and muscovite. Biotite is usually black, or dark bronze-coloured; under the polariser it mostly exhibits a brown tint with a number of dark, parallel lines running across. Its outline is generally very irregular; and the mineral is strongly pleochroic.* Muscovite mica, on the other hand, is of a silvery, or light bronze tint; under the microscope, when viewed at right-angles to the basal plane, it shows tolerably strong chromatic polarisation, in this respect differing from biotite, which, under similar conditions becomes dark between crossed Nicols. An essential constituent of granite and other igneous rocks; found also in many flagstones, the fissility of which is due to the arrangement of minute flakes of mica along certain planes.

Hornblende.—This mineral, although abundant in syenite and other rocks used as road-metal, is not of sufficient importance in our present enquiry to warrant us in describing its micro-characters in any detail. Under the polariser it presents distinct lines of cleavage disposed in such a manner as to produce a lattice-work appearance. It is markedly pleochroic, which, amongst other things, serves to distinguish it from

Augite, which is found in rocks of a similar character. This is only feebly pleochroic, and is remarkable for the inclusion of minute examples of other minerals within it.

Olivine.—This mineral is a common constituent of many basic igneous rocks used in road-metalling, and also of some foreign polished ornamental stones in the English market. It is usually of an olive-green tint, and under the microscope in polarised light gives bright colours, especially red and green. It does not exhibit pleochroism, is generally traversed by fine fissures, and is very liable to become altered into—

Serpentine.—Although it is not certain that the large masses of serpentine at the Lizard and elsewhere in this country were originally olivine, yet the change from the latter to the former may be traced through every possible gradation. Geikie remarks that "there can be little doubt that it is, in most cases at least, a product of the alteration of pre-existing minerals, and especially of olivine." Under the microscope it is pale green, and through its base runs a network of dark opaque threads and veinings. When polished it produces a handsome marble.

Schorl.—Occurs chiefly as long, black, needle-like prisms. Under the microscope it is strongly pleochroic, but may be distinguished from hornblende and biotite by the absence of well-marked lines of cleavage. Common in many granites, especially from Cornwall.

Magnetite.—This is a form of iron—ferroso-ferric-oxide, and is markedly magnetic. Under the microscope it is so intensely opaque that no structure can usually be made out; in reflected light it has a bluish black tint. Common in many igneous building-stones.

Iron Pyrites has a brassy lustre, from which circumstance it may be readily distinguished from magnetite. Like the latter, it is opaque in thin sections. Common in the best-known building stones, and in many slates, as cubical crystals.

Calcite.—A crystalline form of carbonate of lime. Under the microscope clear crystals are readily distinguishable by their intersecting cleavage lines and twinning. It is strongly, doubly-refractive, a property which may be observed by using the analyser alone; it polarises in rose, blue, and grey tints. An exceedingly common constituent of many building stones and marbles.

Aragonite.—Another crystalline form of carbonate of lime, which can only with facility be distinguished from calcite by aid of the microscope, under which it shows biaxial polarisation in convergent light. It is also very common in building stones.

Of all the common rock-forming minerals mentioned in this and in the preceding article, none are as important in the micro-examination of limestones and sandstones as quartz, calcite, and aragonite. The first-mentioned forms the base of nearly all sandstones used in building; whilst the two last-mentioned enter very largely into the formation of oolites and other limestones. But there is a great difference in function and weathering properties between quartz and the other two minerals. Quartz is practically indestructible, even in the open air, and nearly always exhibits a fresh appearance, whether in granites or sandstones; and the weathering properties of the stones containing it essentially, are dependent on its mode of occurrence—whether as mere grains of sand, or as binding together the constituent parts of the material. Calcite and aragonite are both much more unstable minerals, and exist in building stones in various stages of decomposition. On their actual state of decay the preservation of the stone almost entirely depends. In hard crystalline limestone calcite puts on its freshest appearance, and it is more durable in that form than in any other; but one may trace every gradation, from the crystalline to such an earthy condition that it ceases to be calcite, and becomes mere earthy carbonate of lime. So, also, with aragonite.

The student is particularly requested to note that practically every oolite or other limestone used by the architect, contains either calcite or aragonite, or both, together with a certain amount of earthy carbonate of lime. It has been laid down that when the oolitic granules or fragments

* See the last article in this series (p. 204) for a definition of this term.

of shelly matter in a limestone are cemented together by crystalline carbonate of lime, that that stone will prove more durable in a building than one in which the granules and fragments are distributed in a matrix of less crystalline, or earthy carbonate of lime. Now this is not true, or, at least, is very much at variance with the facts, and requires considerable modification. We find, from a careful microscopic examination of several hundreds of building stones, that the granules and fragments are either (1) held together by crystalline calcite (or aragonite, as the case may be), or partially so; or (2) the constituent fragments are merely cemented together at their points of contact with each other, and there is no matrix properly so called; free spaces exist between the fragments which go to make up the stone. In face of this, one would naturally feel inclined to regard the stone with the crystalline matrix as more durable than one with practically no matrix whatever. Yet the reverse is actually the case, and we go so far as to state that the best limestones in the market—Portland, of the Isle of Portland, for example—have little or no matrix, the region between the granules and fragments being quite open. The cause of this will appear in the sequel.

GENERAL MICRO-STRUCTURE OF BUILDING STONES.

Having glanced at the micro-structure of various rock-forming minerals, we are now in a position to explain the manner in which they are built up in rocks. For this purpose we will select typical examples of divers kinds of building stones, and briefly describe their appearance under the microscope. To assist us in this matter we give illustrations of twelve well-known building stones on a double plate in this issue. These illustrations are taken from micro-photographs, and represent the appearance of sections of the stones under the microscope, in transmitted light. Each example being magnified to the same extent (× 50), they are all strictly comparable with one another.

FIG. 1.—*Granite.*—From Carnsew quarry, near Penryn, Cornwall. In this the three essential minerals of granite are seen. The clear portions slightly dotted over here and there are quartz: the striated dark crystal in the centre of the illustration is mica, with its characteristic frayed-out edges; whilst the felspar may be seen in the shaded parts, with no regular structure in this instance. It is particularly desirable to note that none of these minerals are bound together by any cementing material; they are all interlocked with one another and the rock is thoroughly crystalline throughout.

FIG 2.—*Statuary Marble.*—From Carrara, Italy. The whole of the stone is made of small crystals of calcite closely packed together and joined to each other. Some of them show the characteristic twinning, or parallel cleavage lines. The dark, irregularly-defined band running across the section is a small blue vein, probably carbonate of iron.

FIG. 3.—*Banded Shelly Limestone.*—From Ham Hill Quarry, near Yeovil, Somerset. Made of fragments of shelly matter, bound together by crystalline granular calcite. The shells may be seen as longitudinal sections and in pieces having a striated structure; the granular calcite is the infilling substance between these, but the stone is full of free, open spaces, denoted by long light patches. The durability of such a stone depends entirely on the state of crystallisation of the calcite matrix referred to. This structure is extremely characteristic.

FIG. 4. — *Fragmental Limestone.* — From Doulting Quarries (Chelynch bed), near Shepton Mallet, Somerset. Made of fragments of crinoid stems, pieces of shell, &c., bound together by calcite, the whole being so much altered by secondary agents that the edges of most of the fragments are practically fused with the matrix. The calcite of the latter shows the characteristic twinning very clearly, and is not granular. The crinoid stems may be easily recognised by the perforation in or about their centres, and by the arrangement of the regular pittings, or dots. The weathering properties of such a material as this are largely controlled by the relative porosity of the lines of junction of the crystals with one another, and especially by the openness of their cleavage planes.

FIG. 5.—*Organically-formed Hard Limestone.*—From the Carboniferous formation of Charfield, Glos. This mineral, which is much more crystalline, or harder, and more compact than that represented in fig. 4, is made of minute fragments of crinoid stems and plates, shelly matter and other organic remains. The whole is firmly bound together and indurated by calcite of the most durable description. Such material readily takes a polish, and if present in sufficiently large blocks in the quarry can be cut into marble; it is generally too hard for free working, and is used for road-metal and paving setts.

FIG. 6.—*Shelly Limestone.*—From Westwood quarry (paving bed), near Bradford-on-Avon. Composed of fragments of crinoids, long strips of shell, &c., in a matrix of calcite. The large four-sided piece in the centre of the illustration is a characteristic crinoid section. We may mention that this is one of the Bath stones, and that, prior to our investigations, had been thought to be an oolite.

FIG. 7.—*Organic-Fragmental Limestone.*—From Doulting quarries (Brambleditch bed), near Shepton Mallet, Somerset. Made of a heterogeneous assemblage of organic remains, and adventitious particles bound together by rather earthy calcite, and having many free spaces.

FIG. 8.—*Shelly Oolite.*—Bath stone, from Winsley quarries, known as "Winsley Ground" stone. Composed of well-formed oolitic granules, shell fragments, mostly surrounded by oolitic structure, corals, &c.; the whole bound together by granular calcite with cleavage planes not very apparent. It will be noticed that in addition to the matrix, properly so-called, lending support to the stone, that the majority of the fragments are joined to each other. The durability of such a stone as this depends on the state of the granular matrix.

FIG. 9.—*Coarse Shelly Oolite.*—Bath stone, from Westwood quarries, known as "Westwood Ground" stone. Made of large, abnormal oolitic granules, having several granules bound in one, with a fine calcite matrix. The weathering would be controlled by the state of the oolitic granules, the matrix being well formed.

FIG. 10.—*Oolite.*—Bath stone, Kingsdown quarry. Composed of well-formed oolitic granules, not adhering to each other, but having a film of calcite, slightly decomposed between, which binds the whole together. The student can observe true oolitic structure to perfection in this material. The weathering of the stone is dependent on the state of the granules, but mostly on the rather earthy matrix.

FIG. 11. — *Fine-grained Oolite.* — Portland stone, from Tout quarry, Isle of Portland. Made of minute oolitic granules of a crystalline nature, the structure of which has been materially modified by secondary alteration. The granules adhere to one another, and in some cases appear to interlock. The student is particularly requested to note that this stone has no matrix whatever, but that the weathering of the material is entirely dependent on the adhesion of the particles to each other. This structure is exceedingly characteristic of Portland stone.

FIG. 12.—*Sandstone.*—From Corsehill, Annan, Dumfries. Made of sand, partially bound together by iron, which imparts the characteristic red colour to the material. The sand is largely quartzose, but fragments of felspar, &c., here and there occur, whilst in places the matrix (which is very minute in quantity) is infilled with granular quartz. The darker portions are not so dark in reality; they are produced by the red film covering certain of the quartz grains, which, by the photographic process, comes out black.

OBITUARY.

MR. R. C. REID, C.E.—The death has just occurred, at the age of forty-eight, of Mr. R. C. Reid, C.E., Edinburgh. He was a member of the firm of J. & A. Leslie & Reid.

GENERAL BUILDING NEWS.

ADMIRALTY WORKS, APPLEDORE.—The tender of Mr. W. Dart, builder, Crediton, has been accepted by the Lords Commissioners of the Admiralty for the erection of timber-framed two-gun firing-battery drill shed, brick magazine, &c., at West Appledore, Devon. The walls of the battery are of English-oak framings, 12 in. thick, with deals, and roof of Dantzic fir and pitch-pine. The work is to be commenced immediately, and completed in eight months.

WESLEYAN CHAPEL AT FISHPONDS, GLOUCESTERSHIRE.—On the 28th ult., a new Wesleyan Chapel and Schools were reopened at Fishponds. The architect was Mr. William Paul, of Bristol. The chapel itself has been built to seat 450 persons. Adjoining the chapel are a minister's vestry, ladies' vestry for sewing meetings, &c., a general vestry, and also lavatories and other offices. Then there is a school-room with class-rooms to accommodate 500 children, and also another vestry.

TEPID BATHS, IPSWICH.—The tepid baths in St. Clement's, Ipswich, were opened on the 1st inst. by the Mayor, Mr. S. R. Anness. The front of the building, with the exception of a projecting portico, is built with white Ancaster stone. On entering the vestibule on the right hand is the attendant's office, where tickets will be given. Twelve slipper-baths, six on either side of the vestibule, also open into it. The swimming-bath measures 70 ft. by 22 ft. At the shallowest end, that nearest the entrance, there will be 4 ft. of water, while at the lower end the depth will be about 7 ft. 50,000 gallons of water are required to fill the bath. Its walls are of concrete and white glazed brick. Several feet from the edge of the bath round the building are built thirty-three dressing-boxes. The space between the bath and the boxes, and also the floor of the bath, is laid with mosaic paving, by Messrs. Diespeker & Co., Holborn Viaduct. A gallery runs round the entire building over the boxes for the convenience of the public, of whom about 400 can be accommodated at entertainments. The gallery is supported by timber pillars on stone bases. The bath is lighted by a skylight or lantern, 70 ft. in length. Above the boiler-room, which is situated behind the baths, in the basement, are various rooms fitted up for the laundry work of the establishment, such as washing, drying, and mangling. The architect was Mr. T. W. Cotman, and the builders were Messrs. T. Parkington & Son.

NEW BUILDINGS, WOODVILLE, NEAR BURTON-ON-TRENT.—An extensive range of buildings at Woodville, for pottery-ware purposes, for Messrs. Outram & Co., which were contracted for by Mr. John Narlow, of Burton, consisting of slip houses, workshops, greenhouses, clacing shops, hovels, and warehouses, are just completed. These buildings have also been fitted up by Messrs. Boulton & Co., of Burslem, and Messrs. Buxton & Thornley, of Burton, with all the newest plant and machinery, the ovens being built by specialists. The architect was Mr. R. E. Carpenter, of Burton.

CONSERVATIVE CLUB, ABERDARE.—The Aberdare New Constitutional Club was formally opened on the 8th inst. The club, which is situated at the junction of Canon-street with High-street, has been built by Mr. Lissaman from the designs of Mr. T. C. Wakeling, of Merthyr, the cost of the building and furnishing being about 5,500*l.* The premises were erected by the Aberdare Constitutional Club Building Company. On the ground floor there is a large hall with a balcony which is available for general entertainments, the whole being capable of seating 700 people. There is also a bar, a smoking-room, and a dining-room, with cellarage underneath. Upstairs there is a billiard-room fitted with two tables, together with a reading-room, a card-room, a library, a committee room, and bath-room with lavatory, the upper portion consisting of rooms for the use of the manager and manageress.

CHURCH, TURNER'S HILL, SUSSEX. — The foundation-stone has just been laid of the church which is to serve for the new Ecclesiastical parish to be formed out of the ancient parishes of Worth, Ardingly, West Hoathly, and East Grinstead, and from the new parish of Crawley Down, Sussex. The work is being carried out under the supervision of the Diocesan architect, Mr. Lacy W. Ridge, and will be Gothic in design. The whole plan will not be at once carried out, but the nave and aisle, which are in the parts at present in course of erection, are to cost 2,300*l.* The material used externally is Bath and local stone. The contractors are Messrs. James Longley & Co.

WYCLIFFE NEW CONGREGATIONAL CHURCH, TOTTERDOWN.—The new Wycliffe Congregational Church building which has been erected at Totterdown, was opened on the 8th inst. The contract has been carried out by Mr. John Perkins, and the heating apparatus by Messrs. Skinner, Board & Co. The architect is Mr. J. H. La Trobe, of Bristol. We gave some particulars of the new building in our issue for July 22, 1893, page 72.

WORKMEN'S HALL, BLAENGARW, GLAMORGAN.—A workmen's hall has just been erected at Blaengarw. The building consists of a hall 56 ft. long by 36 ft. wide, with a stage and two small ante-rooms at one end, and a gallery round three sides, and altogether provides sitting accommodation for 600 people. In the wing to be devoted to the purposes of the library is a reading-room 40 ft. by 24 ft., a room for the circulating library 19 ft. by 20 ft., and a committee-room 24 ft. by 14 ft. for the workmen. Underneath the library is accommodation for the caretaker, and beneath the hall are large rooms. The contract for the undertaking is 3,099*l.*, and Messrs. C. Jenkins & Son, of Bridgend, are the contractors. The architect was Mr. J. Rees, of Pentre.

WESLEYAN CHAPEL, NEWBRIDGE, CORNWALL.—A new Wesleyan chapel has just been built at Newbridge. The new chapel provides accommodation for about 200 persons. It is some 60 ft. long by 22 ft. in width. At the rear is a class-room, which will also be used as a ladies' work-room for bazaars, and as a senior class-room. The usual out-offices, &c., are in the rear, and are entirely apart from the chapel. The seats are of pitch-pine, and varnished. The communion is of the same wood to match the seats. The style of architecture is Norman. At the main gable end is a three-lighted stained-glass window. The entrances are

on the eastern side, and the doors correspond with the other portions of the building. The chapel is further lighted by six circular-headed windows, each one being 12 ft. high by 4 ft. in width. A portion of the mason's work was carried out by Mr. R. Marks, and another portion by Messrs. Pidwell & Rowe, of Penzance. Mr. Francis Gibson, of St. Just, did the carpentry work. The whole of the work has been carried out under the superintendence of Mr. J. W. Trounson, architect, of Penzance.

CHANCEL, ST. PAUL'S CHURCH, BRISTOL.—On the 6th inst. the consecration took place of the new and extended chancel at St. Paul's Church, Portland-square, Bristol. The works which for some months past have been in progress at the church, forming the first portion of the general improvement scheme, consist of a lengthened chancel in a rectangular form, and increased height, and of a vestry on the south side to receive the organ from the west gallery. The east wall of the sacrarium contains a large five-light traceried window filled with figure subjects, the principal one being that of St. Paul preaching at Athens. Beneath this window is a reredos of Bath stone, with the *Agnus Dei* in the centre, and panels on either side containing wheat and the vine. In the south wall are three sedilias, on the north side being an arched and moulded recess in which is placed the Vassall monument. The walls inside and out are of Bath stone ashlar, and the ceiling of the sacrarium is boarded and divided into panels. The choir stalls are of oak, the pulpit of Bath stone, and the floor of the chancel and sacrarium are laid with encaustic tiles. The general contractor for the work is Mr. George Henry Wilkins. The stone carving has been executed by Mr. Smith, the wood carving by Mr. Wilmot, and the glazing by Mr. Moon. The brass communion rail and standards are the work of Messrs. Singer & Sons, of Frome, who have also supplied the lectern as well as the metal work of the pulpit. The removal and re-erection of the organ was entrusted to Mr. Johnstone. The architect is Mr. John Bevan, of Bristol.

GIRLS' INDUSTRIAL SCHOOL, DUNDEE.—A new girls' industrial school is to be erected in Dundee on the lands of Balgay, on the north side of Blacknessroad and south of the Balgay Hill. The administration department has been confined to the front elevation, the dining-room, kitchen, and offices occupying the east portion, and the school-room and sewing-room the west. The dining-room and school-room will be each 60 ft. long by 23 ft. broad. Advantage has been taken of the fall in the site to obtain a basement story under the scullery wing, to be utilised for a milk pantry and stores. A large store is provided in the west side of the centre block, and the corresponding room on the east side provides for the matron's store. The drill-room and play-room are placed at the north-west corner, the former being fitted with fixed gymnastic apparatus. The washing-house, laundry, and coalhouse fill up the remaining portion of the quadrange. The receiving-room and room for children seeing their parents is placed at the north-east corner. It is cut off from the square, and has its own entrance in sight of those about the kitchen. Entrance to the sick-room will be from the quadrangle, and a door will be provided to the passage for removing infectious cases. A paved verandah gives access to all departments entering off the square. On the first floor two dormitories, with the necessary accommodation for attendants, and each containing twenty-three beds, will be provided on the east and west sides. In the front there will be dormitories for thirteen and six beds respectively, the latter being intended for delicate children, or those having ailments not infectious. The lavatory for younger children is to be fitted with a large bath in the centre, and the east lavatory will have three plunge baths. A clothing store will adjoin each of these lavatories. In the upper part of the staircase a delinquent's room will be provided, and on the third floor, which extends over the centre block, there are three separate girl's rooms intended for those shortly to leave the institution, and to give them a certain responsibility in keeping their own room. The site, which extends to three acres, is situated at an elevation of 290 ft. above the sea level, and will be enclosed eventually by a stone wall. The elevation shows the treatment of Scottish architecture adapted to the domestic character of the institution. Accommodation will be provided in the building for 115 girls, and the cost of its erection will amount to about 10,000*l.* Messrs. James Maclaren & Sons, Dundee, are the architects.

ADDITIONS TO MESSRS. MCDOWALL, STEVEN, & CO.'S PREMISES, UPPER THAMES-STREET.—As we briefly mentioned last week Messrs. Steven Brothers, & Co., architectural ironfounders, have registered their firm as a limited company, under the title of McDowall, Steven, & Co., Limited. The same firm has just carried out various alterations and additions to their warehouse and show-rooms in Upper Thames-street, the whole of the area of the premises of five floors, extending from Upper Thames-street to the river Thames, being now utilised by the firm. On the top floor is the stone and chimney-piece department, which has been rearranged and provided with a glazed roof, and on a higher floor, at the rear, is a new department, which is used exclusively for sanitary goods and which, like the floors below, extends to the river front. The good's lift has also been extended to this floor. The floors below are all used for the storage or display of Messrs. McDowall, Steven, & Co.'s specialities. The good's yard, extending from the front entrance to the river, has been covered in with an iron and glass roof, the work being carried out by Messrs. Croggon & Co. The general contractor was Mr. Charteris, the architect being Mr. H. Percy Moncton, 32, Walbrook, E.C.

SUNDAY-SCHOOL BUILDINGS, NORWICH.—New Sunday-school buildings in connexion with the Primitive Methodists' Chapel in Cowgate-street, Norwich, have just been opened. About 400 children can be accommodated in the school-hall. Mr. A. F. Scott was the architect, and Messrs. Scarles Brothers, the builders.

SANITARY AND ENGINEERING NEWS.

SEWAGE WORKS, EATON HALL.—The Eaton Hall Sewage Works, forming the first section of the Eaton and Eccleston Sewage Disposal Scheme, designed by Mr. Albert Wollheim, Assoc. M. Inst. C. E., under instructions from the Hon. Cecil J. Parker, agent to the Duke of Westminster, have just been opened. The sewage is treated by the Amiens process.

SEA WALL, DYMCHURCH, KENT.—The report of Mr. Wolfe Barry and Messrs. Coode, Son, & Matthews, the engineers called in to report upon the damage to the Dymchurch sea wall by the recent gales, just presented to the Romney Marsh authorities, and now under the consideration of a Committee of the "Lords of the Level of Romney Marsh," shows a very serious state of things. The report is of great length, and considers the wall to be in a critical condition, with the danger, in case of further heavy gales, of possible inundation of the marsh—which is from 8 ft. to 11 ft. below high water at spring tides—with consequent risk of destruction of property and stock, and possibly human life. The scheme recommended by the engineers involves an expenditure of 41,000*l.*, the experts remarking in their report that they regret that they cannot recommend less costly works. The scheme recommends thirteen groynes between the Canal and Willup's sluices, twenty-three groynes to the westward of the sluices, and seven groynes on the War Department portion in front of the Grand Redoubt. The outlay, if borrowed for twenty years, would require a "scot" of 3s. per acre for the first year, the interest diminishing year by year. The further consideration of the matter has been adjourned by the Court for a fortnight, and the War Department are to be approached with regard to the groynes recommended on this portion. A large party of workmen have been engaged in temporary works on the wall, and a "scot" of 1s. has already been made to meet current expenses. Our reporter states that many of the oldest inhabitants disagree with the necessity of the extensive works recommended. At the back of the sea-wall is a puddled clay bank, supposed to have been constructed by the Romans, which, two years ago, proved to be capable of resisting the ingress of the sea, and they consider that this, with less extensive works, would be sufficient to protect the marsh.—*Standard.*

SEWAGE DISPOSAL WORKS, BRACKNELL.—Major-General Crozier, R.E., held an inquiry at Bracknell on the 2nd inst., to consider an application for a provisional order to purchase 22¼ acres of land for sewage disposal works. The sewage is to be purified by irrigation, two pumping stations being necessary, one at each end of the town. Mr. W. H. Radford, C.E., of Nottingham, is the Engineer to the scheme.

SEWAGE SCHEME, BARNOLDSWICK, YORKSHIRE.—A Local Government Board inquiry was held on the 1st inst. by Mr. John Bird Clarke into an application by the Barnoldswick Local Board to borrow a loan for works of sewerage and sewage disposal. Dr. Holt, of the firm of Messrs. Brierly & Holt, engineers, explained the scheme, and stated that the method of sewage treatment to be adopted was that known as the International system. There was no opposition to the scheme, and the inquiry terminated in the usual manner.

FOREIGN AND COLONIAL.

FRANCE.—M. Maurice Leloir, the painter, has organised an interesting exhibition, at the Georges Petit Gallery, of 250 drawings made by him for the illustration of Dumas' celebrated romance "Les Trois Mousquetaires."——The Minister of Public Instruction has filled up three vacant posts in the list of architects to the "Commission des Monuments Historiques," by the appointment of MM. Benouville, Nodet, and Roy, architects who were already attached to the Commission in subordinate positions.——The Municipal Council of Paris has determined to remove the horticultural gardens and greenhouses in which the flowers and shrubs for the parks and promenades of Paris are cultivated, from their present position in Avenue Henri Martin to Boulogne. A Municipal School of Horticulture and Botany is to be formed in connexion with this establishment.——The École Polytechnique, which is about to celebrate its centenary, has commissioned M. Maximilian Bourgeois, the sculptor, to prepare a commemorative medal; while M. Dupain, the painter, has also been requested to prepare a large allegorical picture, in the form of a triptych, to be placed in the Salle d'Honneur of the École.——M. Joseph Blanc, the painter, has been appointed to succeed the late M. Yvon in the Conseil Supérieur of the École des Beaux-Arts.——The jury of the competition for a Mairie at Bagnolet has commissioned M. Pierre Vauthier to carry out the work.——The Chamber of Commerce of Orleans and Loviet has demanded from the Minister of Public Works the concession of a canal from Combleux to Orleans. The town of Orleans gives a million francs towards the work, and the Chamber of Commerce promises a further subscription of 200,000 francs.——A committee has been formed to raise a statue at Bry-sur-Marne to the memory of Daguerre, the inventor of photography.——M. Sarrazin, Inspecteur des Monuments Historiques, to whom was entrusted the conduct of the archæological investigations at Timgad, in Africa, has been appointed architect-in-chief for the "Monuments Historiques" Department for the region of the Sahara.——It is announced that new electric locomotives will soon be seen on the Paris, Lyons, and Mediterranean Railway; locomotives of a very singular appearance, called "Coupe-Vents," the construction of which is just being completed in the workshops at Oullins. The front part of these engines will be pointed in order to offer the least possible resistance to the wind.*——It is stated that the Municipal Council of Paris intend to put an end to the "Bourse du Travail," which in fact has remained closed since the riots of last year.——A large allegorical ceiling painting designed by M. Bonis (selected in a competition) is being fixed up in the Hôtel de Ville at Paris. It is to be surrounded with a decorative border, to be designed by M. Mouré, architect.

MISCELLANEOUS.

PULPIT, EAST BUDLEIGH SALTERTON CHURCH.—A new pulpit has been erected in East Budleigh Salterton Church to the memory of Robert Hartley Lipscomb. It is of oak from designs prepared by Mr. G. H. Fellowes Prynne, F.R.I.B.A., the work being executed by Messrs. Hems & Sons, of Exeter. The cost, when complete, will be 210*l.* There are four panels. The figures are in high relief, and under carved canopies.

THE EAST LONDON ANTIQUARIAN SOCIETY.—The members of this society visited on the 10th inst. the halls of the Barbers and Parish Clerks' Companies. At the former the visitors were received in the court-room by Mr. Sidney Young, F.S.A., the Upper Warden of the Company, who gave an account of the guild, showing the origin and development of the seemingly incongruous union of barbery and surgery. Attention was called to the pictures, especially to Holbein's picture of the Presentation of the Charter by Henry VIII., and Vandyke's portrait of Inigo Jones. Leaving the Barber-Surgeon's Hall, the members were conducted to the seventeenth century upper-chamber in Silver-street, which forms the hall of the Parish Clerks. The Master and Wardens received the visitors. The master, in his subsequent remarks, alluded to the very early foundation of the guild, the work of the Parish Clerks in mediæval times, and to their association with Clerkenwell and the miracle plays.

PROPOSED EXHIBITION OF WORKS OF ART AT PEEL PARK, SALFORD.—It is intended, in connexion with the jubilee celebration of the borough of Salford, to hold an exhibition of paintings and other works of art, which will be publicly opened at Peel Park Museum on April 16—the fiftieth anniversary of the day on which the charter of incorporation was received. The art galleries and lectures sub-committee, to whom the arrangements have been entrusted, have already received promises of assistance from private collectors in and around Manchester, as also from Sheffield, Newcastle, Nottingham, Liverpool, Leeds, Glasgow, Edinburgh, Bradford, and Birmingham, and there is reason to believe that a valuable collection of modern works of art will be brought together. The exhibition will be in the Langworthy and two adjoining large galleries, and will also extend to the walls of the two rooms on the ground floor. These are all in course of being redecorated. The chief manufacturing firms have been invited to send contributions representative more particularly of the textile industries of the district. So far the appeal has met with a satisfactory response.—*Manchester Guardian.*

CONCILIATION IN THE NEWCASTLE BUILDING TRADE.—On the 8th inst. a meeting of the representatives of the Master Builders' Association and those of the Building Trades Federation of the workmen was held in the County Hotel, Newcastle, for the purpose of drawing up a basis of a Conciliation Board for the settlement of all future disputes in the trade. The chair was occupied by Canon Moore Ede, who acted successfully as mediator in the late dispute. Inquiry was first made as to whether the terms of the settlement had been carried out by both parties, and it was agreed that

* If it is supposed that any perceptible decrease of resistance will be obtained by this means we think the projectors will be disappointed. It is unquestionable that the resistance of the wind to the passage of a train operates much more powerfully along the side of the train than against the front of the engine.—ED.

they had on the whole, the men stating that, with one or two exceptions, all the hands had been re-employed. The conference then drew up a basis for the Conciliation Board, the rules of the Board which are in operation in the iron trade being adopted, with certain alterations applicable to the building trade. It was decided to submit the rules for approval to the full meetings of each association, and the conference adjourned.

KINGSLEY MEMORIAL, HOLNE, DEVON. — A Munich stained-glass window, representing the "Adoration of the Magi," has just been erected to the memory of the late Charles Kingsley, in the parish church of his native place, Holne, Devon. In the tracery are a bust of Kingsley and his armorials, and the bugle-horn and crest on either side, while at the foot of the window runs the inscription:—"To the glory of God, and in pious memory of Charles Kingsley, born and baptised in this parish, 1819; died at Eversley, Hants, 1875." The work has been designed and executed by Messrs. Mayer & Co., of Munich and London.

LEGAL.

LIGHT AND AIR ACTION:

LILLICO *v.* COLLS.

ON the 13th inst., in the Chancery Division, Mr. Justice Stirling had before him the case of Lillico *v.* Colls, which had been before the Court several days previously. It was an action brought by the plaintiff, Robert Lillico, of London, to restrain the defendants, Messrs. Colls & Sons, 5, Coleman-street, in the city of London, by injunction, from continuing to erect a building so as to obstruct or darken the windows and light of the plaintiff's messuage, known as No. 1, Maddox-street, Regent-street. Mr. Graham Hastings, Q.C., and Mr. Cann represented the plaintiff; and Mr. Channell, Q.C., and Mr. Fellowes were for the defendants.

Mr. Graham Hastings, in opening the case, read the correspondence which had taken place between the parties prior to the present proceedings being instituted, and which resulted in a failure of the attempt to settle the difficulty amicably. The writ was issued on January 5 last. He would proceed to prove, by the model produced, what he thought would be quite sufficient to show that the defendants could not go on building without blocking out a large amount of sky. The height of the new building to the front of the coping at its highest was 13 ft., while the plaintiff's house at its highest was 10 ft. 6 in., and a great deal of light came in there from the northwards. A great block of buildings had been put up where there was none before, and the effect had been to obliterate the sky to the extent named.

Mr. Robert Kerr, architect, and District Surveyor of St. James's, Westminster, spoke to visiting the plaintiff's premises in Maddox-street, and he found that on the first floor a milliner carried on business. He was disappointed generally at the ill-provision of light for the house, and in the opinion of witness the effect, when the building was completed, would be to materially affect the light accessible to the first floor of the front shop.

Cross-examined by Mr. Channell, witness said: If you saw this room of the milliner's you, too, would say that this was a very dismal room for them to carry on business in. You would agree with me if you knew as much about ladies as I do. Witness further explained that the ladies loved to have as much light as possible when they went to the windows with their bonnets.

Mr. Edward Clarke, architect and surveyor, gave similar evidence.

Mr. Channell, for the defence, submitted that taking away a ray of light did not constitute a legal injury; and the real point at the bottom of this case was whether they had taken away something substantial and material. The learned counsel reflected upon the manner in which this litigation had been lodged, and characterised the affidavits of the plaintiff as untrue.

The learned judge said that since the case was last before him he had had an opportunity of seeing the *locus in quo;* and he had also read through his notes on the evidence in the light of the experience he had gained by his examination of the place. The result had been to lead him to be very dissatisfied with the evidence on both sides, and he said this without, in any way, attributing blame to any person giving evidence in the case. The testimony was simply subject to the ordinary human infirmities; and the conclusion he came to was this: That the case ought not to be disposed of without his obtaining the assistance of a report by an independent expert, as to the alterations which were proposed to be made in accordance with the plans before him. He should, therefore, propose to send the case to a referee whom he should direct to inquire whether the buildings, if completed in accordance with the plans, would materially obstruct the access of light; he gave instructions as to how this should be carried out, and also ordered an inquiry as to damages.

Mr. Graham Hastings said it would be useless on his part to proceed after what had fallen from his lordship; and he supposed that what they had better do was to let the matter stand over generally pending the referee's report?

His Lordship: Yes.

Counsel subsequently stated that they had agreed upon Mr. H. Currey as referee.

DISTRICT SURVEYOR'S FEE.

MEESON *v.* CONSTRUCTIONAL IRONWORKS CO.

A CASE was tried in the Queen's Bench Division, on the 13th inst., before Justices Cave and Wright, relating to district surveyors' fees. The respondent company had erected at the pavilion of the Hackney Infirmary, Homerton, a porch, chiefly of iron and glass. The District Surveyor subsequently discovered it and claimed 5*l.* as the statutory fee, based on the area of the pavilion and the porch together. The company objected to this claim, because the payment of the fee was not included in the specification of the work.

The District Surveyor summoned the company, and the Magistrate decided that the porch was not such an addition as entitled the District Surveyor to a fee, but granted a case.

Mr. Justice Wright said: I cannot understand how the Magistrate came to this strange decision. The District Surveyor is entitled to 30s., the fee for a building not exceeding 400 square feet in area—15s. half the fee—but he has claimed 5*l.*, which he is not entitled to.

Counsel for the District Surveyor pointed out the *nota bene* to the second schedule, and that the amount of the fee, should one be due, was not disputed.

Judgment for the respondent company with costs.

MEETINGS.

FRIDAY, MARCH 16.

Architectural Association.—(1) Mr. F. E. Masey on "Modern Architecture in the East End of London"; (2) Mr. Theo Moore on "Old Architecture in the East End of London." 7.30 p.m.

Sanitary Institute (*Lectures and Demonstrations for Sanitary Officers*).—Dr. Arthur Newsholme on "Nature of Nuisances, including Nuisances the Abatement of which is Difficult." 8 p.m.

Institute of Civil Engineers (*Students' Meeting*).—Messrs. S. Henry Barraclough and Lionel S. Marks on "Coal Storage in the United States." 7.30 p.m.

SATURDAY, MARCH 17.

Architectural Association.—Visit to the Tower of London.

Sanitary Institute (*Lectures and Demonstrations for Sanitary Officers*).—Visit to Barking Sewage Outfall Works.

Royal Institution.—Lord Rayleigh on "Light, with Special Reference to the Optical Discoveries of Newton." VI. 3 p.m.

Glasgow Architectural Association.—Visit to Paisley.

Queen's College, Cork.—Mr. Arthur Hill on "The History of Architecture." X. 3 p.m.

MONDAY, MARCH 19.

Royal Institute of British Architects.—Adjourned Discussion on the London Streets and Buildings Bill. 8 p.m.

Society of Arts (*Indian Section*).—Mr. Joseph Walton on "Indian Railway Extension: its Relation to the Trade of India and of the United Kingdom." 8.30 p.m.

Leeds and Yorkshire Architectural Society.—Mr. W. Henman on "Hospitals." 7.30 p.m.

Builders' Benevolent Institution.—Committee meeting. 5 p.m.

Liverpool Architectural Society.—Mr. Aldam Heaton (London) on "Decoration." 6.30 p.m.

TUESDAY, MARCH 20.

Institution of Civil Engineers.—Discussion on Mr. E. Collins's paper on "The Prevention and Detection of Waste of Water." 8 p.m.

Sanitary Institute (*Lectures and Demonstrations for Sanitary Officers*).—Professor A. Bostock Hill on "Trade Nuisances." 8 p.m.

Royal Statistical Society.—Paper by Mr. Charles Booth. 7.45 p.m.

WEDNESDAY, MARCH 21.

Carpenters' Hall, London Wall (*Free Lectures on Matters Connected with Building*).—Professor Silvanus Thompson on "The Production of Electric Motive Power." 8 p.m.

British Archæological Association.—(1) Mr. R. Lloyd on "The Origin of Parish Church Building." (2) Mr. J. T. Irvine on "Discoveries at Repton Church, Derbyshire." 8 p.m.

Institution of Civil Engineers.—Students' Visit to the Tottenham and Forest Gate Railway.

Builders' Foremen and Clerks of Works' Institution.—Ordinary Meeting of the Members. 8.30 p.m.

SATURDAY, MARCH 24.

Edinburgh Architectural Association.—Visit to Sciennes School.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

1,582.—ARTIFICIAL MARBLES: *F. Grand-Montagne* (Brussels).—According to this patent artificial stones are made by mixing cement with pulverised marble, &c., and then adding zinc oxide. Suitable methods are employed for colouring, and the veining is arranged by the employment of stained silk threads.

3,039.—SASH WINDOWS, &c.: *G. Glasson.*—This patent relates to fittings, fire-escape support, and safety-bars in connexion with the sash-window frames. The frame or frames provide for cords and safety-bars, and also furnishes a receptacle for a fire-escape when desired.

5,380.—CHIMNEYS OR VENTILATING SHAFTS: *H. N. Godward.*—To prevent down-draughts a metal-cone, closed at the bottom end, is, according to this invention, inserted in the top of the chimney, receiving a second cone, open at its narrow bottom end, and enlarged at its top end so as to form a deflecting surface. Air striking the top of the chimney is diverted upwards, preventing down and causing an up-draught.

5,576.—DRAIN-PIPES, &c.: *R. Peffers.*—The pipes or traps, which are the subject of this invention, are fitted with hand holes or "eyes," which, in their turn, are fitted with removable covers. These are cemented in position, and the drain tested. In the event of a choked drain, the covers would be removed, the drain cleared, and the covers cemented on without disturbing any of the jointing of the drain-pipes. There would be no necessity for breaking any of the pipes if choked.

6,207.—SASHES, CASEMENTS, &c.: *H. J. Cooper.*—This invention relates to a fastener in form not unlike the old-fashioned catch in general use, but it has plates, springs, and a locking device which gives much greater security.

6,315.—SASH-FASTENER: *R. H. Froude.*—The catch which is the subject of this invention in this instance is unlike the general form, being a looped link falling on a hemispherical cone or catch, with a notch. In drawing this together, the two sashes are drawn close, and rattling prevented.

19,998.—VENTILATING BUILDINGS: *R. Lofthouse.*—Steam at low pressure is used for ventilating and moistening the air, and suitable pipes are fixed for the delivery and exhaust.

23,818.—ROOFING TILES: *E. Wutke.*—Roofing tiles of cement, with grooves on one side fitting into tongues on the other, are made so that each will dovetail into the other and form a complete bond over the whole of the roof.

3,106.—CEMENT: *W. Webster.*—An improvement on a previous patent (No. 11,765—1892), by which ashes obtained from the burning of vegetable fibre, straw, rushes, reeds, &c., are mixed with the clay and chalk, then burnt, and formed into cement in the ordinary way.

4,178.—DRYING CLAY: *R. Taylor.*—The floor of the place where the articles are to be dried is, according to this patent, levelled and concreted. Over the floor metal sheets are supported on pillars from 3 to 18 in. high. This equalises the temperature, and gives better results in drying.

4,440.—OPENING FANLIGHTS, VENTILATORS, &c.: *E. Drew.*—This invention has for its object to facilitate the opening of ventilators, &c., at any height by a person standing on the floor. An endless cord is made to pass over a grooved pulley, and causes the pulley to travel on a screw quadrant carrying the sash along with it to the required distance, and remaining fastened in any position. When the window is closed the screw slides out of the way of the window-blind. Two split pins hold the mechanism together, and by the removal of these the pulley is at once lifted clear of window for cleaning, &c.

4,625.—VENTILATING ARM OR PIPE FOR TRAPS, &c.: *E. Nayler.*—This is a novel form of bend in the ventilating arm from the top of a water-closet or lavatory-trap designed to assist the flow and prevent back pressure or draught.

6,088.—DRAIN-PIPES, &c.: *P. Stewart.*—A branch pipe instead of inclining extends at right-angles in a line parallel with the surface of the ground. At the end of the pipe is a well with a grating or cover so as to allow the well to be emptied, and prevent stones, &c., from gaining access to the trap.

6,310.—SAW BENCHES: *A. Bridgman.*—A sliding or canting table is provided with automatic means for gripping or holding the work, and releasing its grip or hold as it arrives near the end of the backward motion. A slow motion towards the work and a quick return are also contrived by mechanical devices.

6,982.—IMPROVEMENTS IN WATER-CLOSETS: *T. W. Twyford.*—A somewhat elaborate arrangement of mechanical details is provided, having for its principal object "the concealment, hooding over, and protection of the seat action," so that nearly the whole of the mechanism employed in connexion with the closet is hidden from view.

7,786.—WOOD VENEERS FOR WALLS: *A. J. Boult.*—The sheets of veneer are made corrugated, so that when it shrinks or swells, according to the dryness or moisture of the atmosphere, warping or splitting is prevented, the corrugations simply flattening out or drawing in with the changes of temperature.

NEW APPLICATIONS FOR LETTERS PATENT.

FEBRUARY 19.—3,496, L. Tebbutt, Covering Bricks, Walls, and Similar Surfaces with a Glazed or Enamelled Surface.—3,513, M. Fitzpatrick, Sanitary Drain-pipes.—3,527, W. Foster, Raising and Lowering Sash Windows.—3,544, R. Baxendale, Chimney Pots, &c.

FEBRUARY 20.—3,596, J. Mackie and H. Sutton, Bracing or Fixing Scaffold-poles, Ladders, &c., by means of a Grip or Cramp.—3,598, M. Fitzpatrick, Sanitary Drain-pipes.—3,608, H. Johnson, Ventilators.—3,622, H. Weeden and W. Wilson, Staples or Fastenings for Glass or Iron in Roofing.—3,646, S. Fairall, Sash-fastener.—3,677, J. Hawthorn, Pottery Kilns.—3,689, J. Aitken, Latches for Window-sashes.

FEBRUARY 21.—3,703, G. Brown, Draught Check.—3,708, J. Mair, Window-sashes.—3,741, R. and T. Way, Sash-fastener for Windows, &c.—3,742, J. Hargreaves, Combined Chimney Pot or Cowl for the Prevention of Down-draught in Chimneys.—3,743, G. Clarke and others, Gullies for Sinks, Down-spouts, &c.—3,757, A. Hanneborg, Ditching and Tile-laying Machines.—3,763, J. Featherstone, Sash Window-frames.

FEBRUARY 22.—3,785, A. Ransom, Cowl for Preventing Down-draught, Excluding Wind and Rain, and Creating an Upward Current of Air in Chimneys, Drain-ventilators, &c.—3,802, R. Ames and L. Crosta, Jointing Drain and Sewer-pipes.—3,803, T. Harries, Artificial Stone.—3,823, M. Brooks, Window-sashes.—3,836, H. Dickinson, Fire-resisting Construction.—3,864, C. Bonsey, Dies of Brick and Tile-making Machines.

FEBRUARY 23.—3,885, A. Wynn, Air Bricks.—3,913, W. Potter and J. Cornish, Fixing Tiles to Walls, Ceilings, &c.

FEBRUARY 24.—3,970, L. Shepherd, Screws.

FEBRUARY 26.—4,047, G. Ralston, Automatic and Pressure-closing Water-tight Door.—4,068, A. Cope, Sash Windows.—4,084, J. Franz, Spring or Weight-Actuated Blowers or Ventilators.—4,090, L. Delmas, Roofing.—4,095, H. Cleaver, Mortise Locks.

FEBRUARY 27.—4,120, J. Thomson, Panels or Linings for Roofs, &c.—4,124, J. Merrill, Water-closet Cisterns.—4,131, A. Davey, Set-squares and T-squares.—4,166, J. Parker, Preventing the Bursting of Water-pipes.—4,173, W. Cook, Ventilating Shafts for Sewers, &c.—4,201, F. Sly, Varnish.

FEBRUARY 28.—4,223, P. Baumert & A. Pieck, Artificial Stone or Marble.—4,229, W. Kemp and others, Glazing Bars for Glazing Roofs of Railway Stations, &c.—4,25

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
Sewerage Scheme	Chard Town Council..	15*l.* 15*s.*	April 4
*School Buildings	Gillingham and Grange School Board	.....	April 6
Drainage and Sewerage Schemes	Bishop Auckland Loc. Board	50*l.* 20*l.* 10*l.*	April 25
*Baths and Washhouses	Londonderry Corp. ..	.....	May 1

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Granary, Peterborough	E. V. Sewell	J. Ruddle	Mar. 20
Brick Sewers, &c. near Bristol	St. George's U.S.A.	T. L. Lewis	do.
Road Works, St. Paul's-road, &c.	West Hartlepool Corp.	J. W. Brown	do.
School Buildings, Capel Mawr, Rhoallan-erchrugog, Wales	.....	J. Morison & Son	do.
*Sewerage Works	Waltham Holy Cross Local Board	C. W. Wigg	do.
*Stoneware Pipes, Cement, and Flints	East Ham Local Board	*Official*	do.
Limestone Road Metal	Caerphilly (Wales) Local Board	do.	do.
China Clay Shed, &c.	Preston Corporation	do.	do.
*Road Materials	Bromley Local Board	do.	do.
Underground Convenience, Guildford-street, Leeds	Leeds Corporation	do.	Mar. 21
Kerbing and Metalling Footpaths	Biggleswade Local Bd.	do.	do.
*Road Works	Biggleswade Local Bd.	do.	do.
Sewerage Works (1,600 yards), Roath	Cardiff Town Council	W. Harpur	do.
Ventilating Shaft, &c. (40 ft.), Cranbrook-street	Cardiff Corporation	do.	do.
Dwelling-house, The Green, Flimby, Cumberland	W. Hodgson	.....	do.
Additions, &c. to Schools, Maw Green, Crewe	Church Coppenhall School Board	J. A. Atkinson	do.
Surveyor's Materials	Smethwick Local Bd.	J. C. Stuart	do.
Alterations to Schools, Manchester-road, Bury		D. Hardman	do.
Shed, &c. at Workhouse	Norwich Union	J. B. Pearce	do.
Surveyor's Materials	Clayton-le-Moors Loc. Board	A. Foster	do.
*Making-up Roads, &c.	Walthamstow Loc. Bd.	G. W. Holmes	do.
Residence, Currer Estate, nr Steeton, Yorks	Geo. Smith	W. H. & A. Sugden	Mar. 22
House, Landrake, Cornwall	Sir R. Geffery's Trsts.	D. Ward	do.
School Buildings, Lucan, Ireland	Rev. J. Baxter	J. J. O'Callaghan	do.
Church Restoration, Winforton, near Hereford	.....	Nicholson & Son	do.
Police Station, New-road	Blackpool Town Coun.	J. Wolstenholme	do.
Buildings, Foveran, near Aberdeen	Wilson & Duffus	.....	do.
*Road and Sewer Works	Hendon Local Board	S. S. Grimley	do.
Water Main (eight miles), Wharfedale	Leeds Corporation	T. Hewson	Mar. 23
Reservoir, Filter, &c. Bankhead, N.B.	Lochmaben Loc. Auth.	J. H. Barbour	do.
Alterations to Imperial Hotel, Belfast	Gibson & Robinson	Young & Mackenzie	do.
Granite Road Metal (12,000 tons)	Isle of Ely C. C.	G. J. Moore	Mar. 24
School Buildings, Hawthorne-road	Kettering School Bd.	Gotch & Saunders	do.
Parsonage Buildings, St. Luke's, Haverigg	W. Roberts	.....	do
Brick Gasholder Tank	Malmesbury Gas and Coke Co.	*Official*	do.
Hydraulic Mains, &c.	Keighley Corp.	do.	Mar. 26
*Sewerage Works	Cheshunt Local Board	S. Towlson	do.
Alterations to Church, Linthwaite, Huddersfield	.....	C. H. Fowler	Mar. 27
*Extension of Fish Quay, &c.	Torquay Corp.	H. A. Garrett	do.
Three Police Stations	Burnley Corporation	F. S. Button	do.
*1,150 tons Cast-Iron Water Mains, &c.	Tottenham Loc. Bd.	P. E. Murphy	do.
*Asphalte Paving	do.	do.	do.
*Coast Guards' Houses, Bottom, nr Swanage	Admiralty	*Official*	do.
*Painting and other Works	St Marylebone Gdns, Mile End Old Town Vestry	do.	Mar. 28
*Mortuary	.....	J. M. Knight	do.
*Reparation of Rochford Church Tower	.....	F. Chancellor	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Band Room at Schools, Banstead	Kensington & Chelsea School District	A. & C. Harston	Mar. 29
Reservoir Embankment, &c. Earl's Burn	Falkirk and Larbert Water Trustees	A. & W. Black	do.
Eight Houses and Shop, Park-street	Morley (Yorks) Co-op. Soc. Lim.	G. B. Clegg	do.
Grand Stand, Offices, &c. Colwick-park, Nottingham	Nottinghamshire Agri. Society	*Official*	do.
Engineering Laboratory, Lower Canal Walk	Hartley Council, Southampton	W. B. G. Bennett	do.
Stabling, Shops, &c.	Abergavenny Improvement Commrs.	J. Haigh	do.
Offices	Derbyshire C.C.	*Official*	do.
*Rock for Sea Wall	Level of Romney Marsh	do.	Mar. 30
*Tar or Asphalte Paving	Wrexham U.S.A.	do.	Mar. 31
*Wooden Landing Stage, Ramsgate Harbour	Board of Trade	do.	do.
*Paving Works	Romford Local Board	do.	do.
*Tank, Retort House, &c.	Beccles Water & Gas Co.	do.	do.
*Boiler House, Neepsend Station	Sheffield United Gas Light Co.	J. W. Stevenson	do.
*New Buildings, Liquor Tanks, &c. Grimesthorpe Station	do.	do.	do.
Road Improvements, Linacre-road	Litherland (Lancs.) L.B.	W. B. Garton	do.
School Buildings, near Southampton	Millbrook Sch. Bd.	A. F. Gutteridge	April 2
School Buildings, Glyn Neath, Wales	Upper Neath Sch. Bd.	T. C. Wakeling	do.
*Wood Paving Works	Islington Vestry	*Official*	do.
*Tar-Paving, with Kerb and other Appurtenances	Hendon R.S.A.	do.	do.
Concrete Swimming Bath, Western Shore	Southampton Corp.	W. B. G. Bennett	April 3
*Granite Kerb and Granite Edge	Borough of Croydon	*Official*	do.
School Buildings, Cowpen Quay, Blyth	Cowpen (U.D.) Sch. Bd.	J. H. Morton	do.
*Works at Swithland Reservoir	Leicester Corp.	J. B. Everard	do.
*Five Cottages, and Additions to Sewage Works, Esher	Kingston U.R.S.A.	*Official*	April 4
*Inland Revenue Office, Manchester	Com. of H.M. Wks.	do.	do.
*Infectious Diseases Hospital	Boro. of Burton-upon-Trent	J. E. Swindlehurst	April 5
Granite, &c. Road Metal (1,000 yards.)	Bexhill Local Board	M. D. Graves	do.
*Post Office, Cardiff	Com. of H.M. Wks.	*Official*	April 11
*Swimming Bath, Bishop's Stortford	East of England Non-conformist Sch. Co. Limited	J. Slater	No date
Cottage, &c. Caul Clough	Burnley Corp.	W. Williamson	do.
Excavation Work	Manchester Ship Canal Oil Storage Co.	G. Wadsworth & Son	do.
Three Houses, Moston (Lancs.)	J. F. Chadwick	E. Garside	do.
Alterations, &c. Ferbane Church, King's county, Ireland	.....	J. F. Fuller	do.
Four Shops and Twelve Houses	Jno. Hobson	.....	do.
Forty Houses, Crofton, near Wakefield	Nostell Colliery	.....	do.
Two Houses, Taverners-road, Peterborough	Clare & Cauldwell	.....	do.
Six Houses, Ashton New-road, Clayton, Manchester	J. Hamnett	.....	do.
Improvement of National Schools, Adrigole, Ireland	Rev. J. Donnell	.....	do.
Three Houses, Sandon-street, Wigan	A. Jacques	Johnson & Son	do.
*Works and Materials	War Department	*Official*	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Foreman for Sewer Works	St. George the Martyr, Southwark	2*l.* 2*s.*	Mar. 19
*Surveyor	Shirley and Freemantle U.S.A.	120*l.*	do.
*Clerk of Works	Enfield Local Board	.....	Mar. 20
Engineer and Surveyor's Assistant	Metrop. T.C.	140*l.*	Mar. 21
*Instructors in Woodwork	Sch. Bd. for London	Min. 100*l.*	Mar. 29
*District Surveyor	Lancashire C.C.	200*l.* &c.	April 2

Those marked with an Asterisk (*) are advertised in this number. *Competitions, p.* iv. *Contracts, pp.* iv., vi., viii. *and* x. *Public Appointments, p.* xviii. xix. *and* xxi.

T. Latham and others, Hinge and Spring.—4,256, E. Hughes, Kilns.

MARCH 1.—4,309, G. Anderstone, Stone-dressing Machinery.—4,311, J. Morris, Whitewash Brushes.—4,322, R. Holt, Syphon Flushing Cisterns for Water-closets, &c.—4,360, J. Greenall, Supports for Pipes, &c.

MARCH 2.—4,377, M. Martin, Ventilator.—4,403, J. Clegg & G. Parkinson, Doing away with Cords and Weights in Sashes.—4,410, G. Hunt & D. Sutcliffe, Water-closet Cisterns.—4,418, D. McCaig, Chimney Cones or Cowls.—4,420, W. Moore, Lead, Iron, and other Pipes.—4,425, E. Alpaugh, Braces for Turning Bits.—4,447, H. Jury & H. Cockell, Drain-pipe support.

MARCH 3.—4,493, G. Housden & F. Pateman, Chimney Pots and Ventilators.—4,492, H. Lassam, Sash Bars or Astragals for Securing and Carrying Glass for Roofs and other Structures.—4,494, G. Henderson, Window Frames.—4,503, S. Meyer, Water-pipes.—4,511, A. Wynn, Windows.—4,525, W. Sheppard, Kilns for Burning Bricks, &c.—4,526, W. Thompson, Metallic Roofing for Tiles or Covers.—4,530, J. Chadwick & C. Preston, Ventilators.—4,538, J. Hall, Lime Kilns.

PROVISIONAL SPECIFICATIONS ACCEPTED.

24,089, W. Jung, Door-locks.—643, T. Jacob, Window Silencer.—682, A. Braid, Fire-grate or Stove.—1,038, J. Chapman, Joiners' Ratchet and other Braces.—1,422, S. Morley, Gulleys.—1,547, N. Sörensen, Transportable Glue Stove.—1,658, A. Soar, Tread for Stairs, &c.—1,987, The Patent Gully Company, Limited & L. Crosta, Surface-water Gullies.—2,009, F. Kingston, Flushing Closets, Urinals, Sinks, &c.—2,039, W. Hall & W. Baylis, Draught Excluder for Doors, &c.—2,146, W. Bird, Raising and Lowering Curtains hung in front of Doors, when the Doors are opened or closed.—2,391, P. Frye, Drain Testing and Fumigating Apparatus.—2,550, E. Carver, Fire-grates.—2,595, H. Lake, Balancing and Fastening Window-sashes.—2,688, B. Ikin, Metallic Facing Plates for Brick or other Structures.—2,809, H. Jeffery, Composite Wood Pavements.—1,181, C. Wicksteed, Drill Ratchet Braces.—1,370, A. & H. Hooydoak, Preparation or Compound for Decorating the Interior of Buildings.—1,646, H. Burton, Safety Window Catch.—1,727, J. Bull, Panic Bolt for Theatre Doors, &c.—1,733, J. Louvet, Closing, Fastening, and Holding Doors Open.—1,747, The Ariel Company, Limited, and S. Allin, Door Check.—1,860, G. Kirk, Automatic Sash-fastener.—2,643, G. Newman, Door Springs and Checks.—2,799, W. Pape, Draught Excluder for Doors.—2,850, C. Lea, Attaching Door Knobs to their Spindles.—2,862, W. Palmer, Checks for Doors, Windows, &c.—2,911, W. Blair, Window Catch.—2,996, G. Marsden, Tiles.—3,016, A. Higgs, Fire Grates and Chimney Flues for Dwelling-houses, &c.—3,153, A. Hartley, Windows.—3,199, H. Keene, Securing Scaffolding Together.—3,286, J. Rettie, Buildings.—3,325, A. Dewson, Machine for Grinding or Whetting Chisels or other Edged Instruments.—3,496, L. Tibbutt, Covering Bricks, Walls, and Similar Surface with a Glazed or Enamelled Surface.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

8,242, T. Gawthorp, Sash-fastenings.—8,680, W. Toone, Ventilation.—12,773, T. Wallace, Hanging Cupboard or Wardrobe.—24,965, A. Viale, Closets.—25,094, J. Gerrans, Cistern Valves.—788, L. Entres, Mortice Door-locks with Spring Bolts.—961, J. Chevalier, Saws for Cutting Stones, &c.—1,362, T. Aldridge, Tile for Roofing and Facing Buildings.—7,447, J. Sellars, Applying Cement, or Analogous, or other Materials to Surfaces.—8,147, D. Keith, Bath Fittings.—8,538, T. Gardiner, Glazing.—24,780, J. Campbell, Raising, Lowering, and Retaining Window-sashes, &c.—73, O. Stifft, Brick Kilns.—2,079, G. Wiese, Liquid Glue.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

MARCH 5.—By *Walker & Runtz:* 46, Clareville-grove, Kensington, u.t. 25 yrs., g.r. 6*l.*, r. 40*l.*, 340*l.*—By *Chesterton & Sons:* An i.g.r. of 50*l.*, Earl's Court-rd., Kensington, u.t. 60 yrs., g.r. 10*s.*, 740*l.*—By *W. T. Marsh:* 7, 10, Alma-ter., Kensington, f., r. 120*l.*, 2,000*l.*; 10, Campden House-rd., u.t. 49 yrs., g.r. 7*l.*, r. 60*l.*, 670*l.*; 12, Gordon-pl., u.t. 49 yrs., g.r. 8*l.*, r. 65*l.*, 750*l.*—By *W. A. Blakemore:* A plot of f. land, Scrafton-rd., Ilford, 39*l.*; i.g.r. of 41*l.*, Chepstow-rd., &c., Croydon, u.t. 69 yrs., g.r. 4*l.* 5*s.*, 870*l.*; i.g.r. of 24*l.*, u.t. 69 yrs., g.r. 17*l.*, 155*l.*

MARCH 6.—By *C. R. Foster:* 42, 44, Church-st., Croydon, f., r. 60*l.*, 1,250*l.*—By *Driver & Co.:* 3, Princes-st., Westminster, u.t. 11½ yrs., g.r. 2*l.* 10*s.*, r. 280*l.*, 2,000*l.*—By *C. & H. White:* 11, 13, Albert-st., Kennington, u.t. 49 yrs., g.r. 6*l.*, r. 60*l.*, 585*l.*—By *C. F. Dowsett:* F.g.r. of 68*l.*, Beaumont-rd., Plaistow, reversion in 70 yrs., 1,340*l.*

MARCH 7.—By *M. Hubbard:* "The Southampton Arms," Highgate-rd., f., r. 100*l.*, 1,880*l.*; 141, Highgate-rd., f., r. 110*l.*, 1,630*l.*; 6, Wesleyan-pl., f., r. 28*l.*, 430*l.*; 5, Grove-rd., u.t. 58 yrs., g.r. 7*l.* 14*s.*, 515*l.*; "The Falkland" Public House, Falkland-rd., Kentish Town, u.t. 68 yrs., g.r. 10*l.*, r. 60*l.*, 760*l.* — By *Langridge & Freeman:* 22, 24, 26, Caspian-st., Camberwell, f., 825*l.*—By *George Head & Co.:* 47, Chippenham-rd., Harrow-rd., u.t. 69 yrs., g.r. 4*l.*, r. 65*l.*, 790*l.*; 49, Chippenham-rd., u.t. 69 yrs., g.r. 4*l.*, r. 80*l.*, 980*l.*; 3, Clarendon-st., u.t. 69 yrs., g.r. 8*l.*, r. 27*l.*, 140*l.*—By *Rushworth & Stevens:* F.g.r. of 4*l.*, Francis Cottages, Finchley, reversion in 46 yrs., 200*l.*; 48, Marchmont-st., Brunswick-sq., u.t. 5 yrs., g.r. 13*l.* 13*s.*, r. 60*l.*, 105*l.*; 60, Marchmont-st., u.t. 5 yrs., g.r. 13*l.* 13*s.*, r. 60*l.*, 120*l.*; 8, Albion-rd., Lewisham, u.t. 63 yrs., g.r. 14*l.*; 7, Albion-rd., l.g.r. of 9*l.*, same term, 230*l.*; 21, 23, 29, 31, Henley-st., Battersea, u.t. 67 yrs., g.r. 10*l.*, 435*l.*—By *Wootten & Green:* 19, 21, 23, Somerford-grove, Tottenham, u.t. 82 yrs., g.r. 15*l.*, 390*l.*; 39, 41, 45, Somerford-grove, u.t. 82 yrs., g.r., 15*l.*, 390*l.*; By *Reynolds & Eason:* 12, Charles-sq., Hoxton, f., 705*l.*; 53, 56, 57, Greenfield-st., Commercial-rd., f., 575*l.*; 23, Moore Pk.-rd., Chelsea, u.t. 56 yrs., g.r. 6*l.*, 405*l.*; Cornwall-rd., Tottenham, g.r. 15*l.*, r. 60*l.*, u.t. 60 yrs., 705*l.*; 7, Dagmar-ter., Hackney, u.t. 50 yrs., g.r. 4*l.* 15*s.*, 410*l.*—*Turner, Lupton & Co.:* 8 to 14, Wharf-rd., Wormley, Herts, f., 675*l.*; Four f. cottages, New-st., Hampton, and plot of land, 490*l.*

MARCH 8.—By *Boyton & Pegram:* A plot of f. land, 3 a. 0 r. 5 p., Munster-rd., Fulham, 3,350*l.*; 57, 61, 63, Strode-rd., f., 650*l.*; 13, Delvino-rd., u.t. 85 yrs., g.r. 6*l.*, r. 32*l.*, 300*l.*; 7, 8, Molesford-rd., u.t. 85 yrs., g.r. 12*l.*, r. 64*l.*, 630*l.*; 2 to 12 (even), Brunthwaite-rd., Walham Green, u.t. 85 yrs., g.r. 31*l.* 10*s.*, 1,270*l.*—By *Eves & Son:* 54, Buxton-st., Mile End, f., r. 40*l.*, 515*l.*; 2, High-st., Marylebone, the lease of, u.t. 4 yrs., r. 100*l.*, 280*l.*—By *C. C. & T. Moore:* 205, 207, Devons-rd., Bromley-by-Bow, f., r. 45*l.*, 570*l.*; 20A, 22A, Furze-st., f., r. 50*l.*, 500*l.*; three plots of f. land in Furze-st., 290*l.*; f. cowhouse, &c., Winterton-st., Commercial-rd., area 4,350 ft., 1,050*l.*; 22, Bancroft-rd., Mile End, u.t. 63 yrs., g.r. 5*l.* 5*s.*, 710*l.*; 8 to 14, Steward's-rd., Poplar, u.t. 54 yrs., g.r. 28*l.*, 250*l.*—By *Newbon & Co.:* I.g.r. of 325*l.*, Seven Sisters-rd., Finsbury Pk., u.t. 72 yrs., g.r. 200*l.*, 2,275*l.*; 1 to 23, and 1A to 23A, Cathall-rd., Leytonstone, f., 4,875*l.*; 24 to 27, Cathall-rd., f., r. 103*l.*, 850*l.*; 11 to 21 (odd), Beulah-rd., f., 1,050*l.*; 1 and 2, Emily Villas, and 3 and 4, Mayville-rd., f., 520*l.*; 1 to 4, Cathall-rd., f., 595*l.*; "The Welcome Mission Hall," Cathall-rd., f., 370*l.*—By *Ball, Norris, & Hadley:* C.g.r. of 125*l.*, Broadway, Ealing, reversion in 12 and 14 yrs., 4,650*l.*; 151, Loughborough-rd., Brixton, u.t. 28 yrs., g.r. 6*l.* 6*s.*, r. 43*l.*, 290*l.*; f.g.r. of 12*l.*, Cromwell-rd., Holloway, reversion in 73 yrs., 295*l.*; 33 to 39 (odd), Burghley-rd., Kentish Town, u.t. 68 yrs., g.r. 26*l.* 18*s.*, r. 181*l.*, 1,255*l.*—By *Stimson & Sons:* 48, Willowbrook-rd., Peckham, f., r. 40*l.*, 820*l.*; 72, Marmont-rd., u.t. 62 yrs., g.r. 5*l.*, with goodwill, 750*l.*; f.g.r. of 12*l.*, Chaucer-rd., Herne Hill, reversion in 87 yrs., 320*l.*; 55 and 57, Chaucer-rd., f., 855*l.*; 26, Millbrook-rd., u.t. 29 yrs., g.r. 4*l.* 4*s.*, 280*l.*; a plot of f. land, Albion Hill, Loughton, 300*l.*; 1, 2, and 3, Sarahter., Leytonstone, f., 990*l.*; four plots of f. land, Woodhouse-rd., Sarah-ter., 220*l.*; 29, 30, 31, and 32, Percy-ter., Hackney, u.t. 75 yrs., g.r. 10*l.*, 200*l.*; 144 and 146, Turner's-rd., Bow, u.t. 68 yrs., g.r. 10*l.*, 385*l.*; a plot of land, Napier-rd., Croydon, u.t. 83 yrs., no g.r., 22*l.*

MARCH 9.—By *Messrs. Leage:* 1, Burlington-gardens, Acton, u.t. 83 yrs., g.r. 10*l.*, r. 36*l.*, 300*l.*; 20, Alfred-pl., u.t. 83 yrs., g.r. 9*l.*, r. 30*l.* 305*l.*; l. rental of 105*l.*, Chilworth-st., Paddington, u.t. 43 yrs., g.r. 15*l.*, with reversion for 4½ yrs., 1,505*l.*; 17, 19, 20, College-lane, City-rd., u.t. 48 yrs., g.r. 10*l.* 10*s.*, r. 86*l.*, 535*l.*—By *Hunter & Hunter:* 21, 25, Fordingly-rd., Paddington, u.t. 86 yrs., g.r. 14*l.*, r. 84*l.*, 720*l.*; 38, Josephine-av., Brixton, u.t. 71 yrs., g.r. 9*l.*,

[£ 10s., 430l.—By Towers, Ellis, & Co.: Westbourne ..ct., Bayswater, u.t. 55 yrs., g.r. 9l., 525l.

Contractions used in these Lists.—F.g.r. for freehold reversionary ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street.; rd. for road; sq. for square; pl. for place; ter. for terrace cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.

...heart, B.G.	ton	9/0/0 0/0/0
...k, E.I. ...load		9/10/0 16/0/0
...sia, U.S.ft.cu		2/3 2/6
...d, Canada load		2/15/0 4/0/0
...ch, do.,.....		2/5 0 3/5 0
... do.		3/10/0 4/15/0
... Dantsic, &c.		1/5/0 2/10/0
...t do.		2/10/0 4/15/0
...Canada		5/10/0 7/0/0
...e, Canada red		2/10/0 3/0/0
Do. Yellow ..		2/10/0 4/15/0
... Dantsic, fath		4/10/0 5/10/0
... Petersburg..		5/0/0 6/10/0
...tscot, Riga, &c., log		2/5/0 4/10/0
...ssa, crown....		2/5/0 4/10/0
...ash, Finland ...ed & 1st std 100		8/0/0 10/10/0
... 4th & 3rd ..		7/10/0 8/0/0
Do. Riga		7/10/0 9/0/0
St. Petersburg, 1st yellow		10/0/0 13/10/0
Do. 2nd yellow		8/0/0 9/0/0
Do. white		8/10/0 11/0/0
Swedish.....		8/10/0 16/10/0
White Sea....		8/0/0 16/10/0
Canada, Pine 1st		22/10/0 29/10/0
Do. do. 2nd....		17/0/0 18/10/0
Do. do. 3rd, &c.		7/10/0 10/5/0
Do. Spruce, 1st		9/0/0 11/0/0
Do. do. 3rd & 2nd		6/10/0 7/10/0
New Brunswick		6/0/0 7/5/0
Battens, all kinds		3/0/0 15/0/0
Flooring boards, sq., 1 in. prep. 1st		0/10/0 0/15/0
Do. 2nd.....		0/7/6 0/12/6
Other qualities—		0/5/0 0/7/0
Cedar, Cuba .. ft.		1⅜ 1½
Honduras, &c.		1⅜ 1½
Mahogany, Cuba		1⅜ 1/6
St. Domingo, cargo av.		1/3 2/6
Mexican do. do.		1/3 1/4
Tobasco do. do.		1⅜ 1/6
Honduras do. ..		1⅜ 1⅝
Box, Turkey ton		4/0/0 13/0/0
Rose, Rio.....		8/0/0 18/0/0
Bahia		7/0/0 17/0/0
Satin, St. Domingo.....		0/0/5 0/1/2

TIMBER (*continued*).

Satin, Porto Rico		0/0/6 0/1/6
Walnut, Italian ..		0/0/3½ 0/0/7

METALS.

Iron—Pig, in Scotland .....ton		2/2/11½ 0/0/0
Bar, Welsh, in London		5/17/6 6/0/0
Do. do. at works in Wales.....		5/7/6 5/10/0
Do. Staffordshire, in London		6/0/0 6/10/0
COPPER — British cake and ingot		42/10/0 43/0/0
Best selected ..		43/0/0 44/0/0
Sheets, strong ..		51/0/0 52/0/0
Chili bars		40/18/9 41/3/9
YELLOW METAL lb		0/0/4¾ 0/0/5
LEAD — Pig, Spanish.....ton		9/5/0 0/0/0
English com. brands.....		9/7/6 0/0/0
Sheet, English, 6 lbs. per sq. ft. and upwards....		11/0/0 0/0/0
Pipe.....		11/10/0 0/0/0
ZINC — English sheet.....ton		19/10/0 0/0/0
Vieille Montagne		20/0/0 0/0/0
TIN—Straits.....		68/15/0 69/5/0
Australian		69/5/0 69/15/0
English Ingots..		70/0/0 70/10/0
Banca		70/0/0 70/10/0
Billiton		67/0/0 67/10/0

OILS.

Linseed ..... ton		20/5/0 20/7/6
Cocoanut, Cochin		30/0/0 0/0/c
Do. Ceylon		23/10/0 23/15/0
Palm, Lagos.....		24 10/0 0/0/0
Rapeseed, English pale		21/15/0 22/0/0
Do. brown.....		20/5/0 0/0/0
Cottonseed ref....		22/0/0 22/10/0
Oleine		22/0/0 24/0/0
Lubricating, U.S.		4/0/0 5/0/0
Do. refined		5/0/0 12/0/0
TAR — Stockholm barrel		0/21/0 0/0/0
Archangel.....		0/21/0 0/0/0

TENDERS.

**** Next Week** communications for insertion under this heading must reach us *not later than* 10 *a.m. on Wednesday*, as we go to press a day earlier than usual.

ABERDEEN.—Accepted for causewaying Palmerston and two other roads, macadamising Lower Denburn, &c., for the Town Council. Mr. D. Dyack, Burgh Surveyor, Town House, Aberdeen:—

J. McAdam & Sons, Aberdeen	£199	5	0—Causewaying Green.
,, per sq. yd.	0	1	9—Macadam. Lower Denburn.
Robert Gair, Aberdeen	586	2	0—Causeway, Stills-road.
R. McKay, Abergeldie-road, Aberdeen.	3,086	18	0— ,, Palmerston-road.

BARNSLEY.—For the erection of six houses, Cemetery-road and Tune-street. Messrs. Wade & Turner, architects, 10, Pitt-street, Barnsley:—

Masonry, &c.—Medley & Son	£360 6 0
Joinery.—Watling..	201 10 6
Slating.—Fleming	51 5 0
Plumbing and Glazing.—Harrison	25 5 0
Plastering.—Marshall	55 0 0
Painting.—Todd	15 15 0
[All of Barnsley.]	

BOLTON.—Accepted at schedule of prices for sewering, &c., Dorset and eight other streets, for the Town Council. Mr. Brockbank. Borough Surveyor, Town Hall, Bolton:—

Contract No. 644.—Dorset-street.
William Pollitt, Pool-street, Bolton.
Contract No. 645.—Lever Grove, &c.
Thomas Kilburn, Arrowsmith Terrace, Bolton.
Contract No. 646.—Brandwood-street and Back Brandwood-street.
David Holt, Curtis-street, Horwich.
Contract No. 647.—Oxford Grove, &c.
Thomas Kilburn, Arrowsmith Terrace, Bolton.

BRENTFORD.—For the formation of a promenade, Boston-road, for the Local Board. Mr. J. H. Strachan, Surveyor, Clifden House, Boston-road, Brentford:—

J. Mowlem & Co. ..	£625	0	0
W. E. Constable & Co.	558	10	0
T. Adams	517	0	0
Surveyor's estimate			£515

W. Parker £505 16 5
J. E. Broderick & Co. 491 15 1
J. Ball, Chiswick* .. 455 0 0
*Accepted.

BUCKHURST HILL (Essex).—For the enlargement of school buildings, Prince's-road, for the Chigwell School Board. Mr. E. Egan, architect, Loughton and Chigwell. Quantities by architect:—

C. S. Foster	£2,958	5	0
H. Wells & Son	2,694	0	0
E. Fuller	2,687	0	0
W. Radley	2,642	16	0
Jas. Rivett	2,484	0	0
T. White & Son	2,461	8	9
H. Brown	£2,448	0	0
T. Binny	2,400	0	0
Jas. Holland.....	2,400	0	0
W. Daniels	2,353	0	0
Bateman, Ramsey, Hunts (accepted)	2,177	0	0

BUCKHURST HILL (Essex).—For laying tar-paving to the playground of boys' board school at Prince's-road, Buckhurst Hill, for the Chigwell School Board. Mr. E. Eagan, architect, Loughton and Chigwell. Quantities by the architect:—

G. C. Rutty	£170	0	0
W. & C. French.....	162	15	10
Bensted & Son	161	2	10
W. Merrin	159	7	0
W. E. Constable & Co.	159	6	11
Fry Bros.	148	1	7
Jas. Aldred	142	0	0
J. J. Ingham	132	10	6
A. W. Hobman & Co.	£130	15	0
D. Marchin	126	18	0
Josiah Smart	125	9	3
North of England Asphaltic Co.	123	2	8
Asphaltic Limestone Paving Co., Queen Victoria-street, E.C.*	121	13	4

*Accepted.

BURNLEY.—Accepted for the erection of sulphate works, at gasworks, Lanebridge, for the Corporation. Mr. F. S. Button, C.E., Borough Surveyor, Town Hall, Burnley. Quantities by Surveyor:—

Bricklayers' work.—Thomas Smith, Burnley..	£491	14	4
Carpenters' work.—George Smith & Sons, Burnley	75	4	0
Ironfounders' work.—Edward Wood, Manchester	67	13	0
Slaters' work.—William Schofield, Burnley....	34	17	5
Plumbers' work.—J. Shoesmith, Burnley	96	15	4
Painters' work.—J. Shuttleworth, Burnley	4	13	6

BURSLEM.—For the erection of infirmary buildings, vagrant wards, &c., at the workhouse, Chell, for the Union Guardians. Messrs. Ford & Slater, architects, Over House-chambers, Burslem:—

Builders' Work.		*Yorke & Goodwin, Tunstall (accepted)*	£7,750
C. Smith	£9,720		
Jas. Bowden	8,866		
Wm. Grant.....	8,540		
Engineers' Work.			
Wm. Boulton & Co.	£1,322	Lee	£1,265
Tagg & Co.	1,275	Renshaw & Co.....	1,250

CARDIFF.—For new Congregational chapel, Cowbridge-road, Cardiff:—

	Chapel.	Schoolroom.	
Wood & Son.....	£2,582 ..	£619 ..	£3,200
George Mercy	2,397 ..	598 ..	2,995
J. W. Rodger	— ..	— ..	2,895
John Rees.....	2,210 ..	599 ..	2,809
David Davies	2,214 ..	582 ..	2,796
Chas. Rook	2,217 ..	536 ..	2,753
Lattey & Co.....	2,177 ..	573 ..	2,750
Cadwaller & Hockridge ..	2,157 ..	542 ..	2,699
E. Turner & Sons	2,158 ..	518 ..	2,676
John Haines.....	2,140 ..	490 ..	2,630
W. Lissiman.....	2,050 ..	483 ..	2,530
W. Symonds.....	2,045 ..	492 ..	2,537
T. Colborne	2,048 ..	412 ..	2,450
E. R Evans	1,780 ..	500 ..	2,280

CARLISLE.—Accepted for the restoration of the "Crown" inn (after fire), Lamonby, for William Scott, Green-lane, Dalston, Cumberland. Mr. John Braty, surveyor:—

Masons' and Slaters' work.—William Lightburn, Lamonby £93 5 0
Joiner, Carpenter, Painter, &c.—John Scott, Hesket-new-Market 115 0 0

CHELMSFORD.—For the erection of a gymnasium at King Edward's Grammar School. Mr. Charles Pertwee, architect, Bank Chambers, Chelmsford:—

F. Johnson	£375	0	0
William Fincham	348	0	0
E. West.....	347	0	0
John Rayner	330	0	0
H. Potter	315	0	0
Lummis & Son	£308	13	8
E. Saltmarsh	285	0	0
Beckett Bros., Chelmsford (accepted)	283	0	0

EASTBOURNE.—For the construction of boundary walls, for enlarging the cemetery, Ocklynge, for the Burial Board. Mr. H. Euean Rumble, architect, 27, Hyde-gardens, Eastbourne:—

C. P. Dennis.....	£1,776	W. Backhurst	£1,530
J. Martin	1,604	J. Peerless, Eastbourne*..	1,492
*Accepted.			

EASTWOOD (Nottingham).—For the Eastwood and Greasley sewerage works, for the Basford Union Rural Sanitary Authority. Mr. Herbert Walker, Engineer, Nottingham:—

Contract No. 1.—Outfall Works.

J. F. Price.....	£6,185	0	0
J. Band	5,580	0	0
Thos. Adams	5,871	18	4
Thos. Cuthbert	5,827	0	0
Js. Dickson	5,739	0	0
Herbert Weldon....	5,668	0	3
Hy. Vickers	5,575	0	0
David Barry.....	£5,560	10	6
Jones & Fitzmaurice	5,553	17	0
B. Cooke & Co.	5,379	0	0
J. Tomlinson	5,308	5	6
J. H. Vickers	5,190	0	0
T. Smart, Nottingham (accepted) ..	5,013	10	0

[Engineer's estimate, £5,060 0 0.]

Contract No. 2.—Sewers and Pumping Station.

J. F. Price	£21,332	12	0
Thos. Adams.....	18,852	9	9
Jones & Fitzmaurice	18,051	13	8
Jenkins & Son	17,756	0	0
B. Cooke & Co....	17,735	0	0
J. Tomlinson	17,268	0	0
Jas. Dickson	17,249	0	0
John Band	16,850	0	0
James Bradley	15,658	14	5
J. H. Vickers.....	£15,600	0	0
David Barry	15,485	6	0
Thos. Smart	15,429	10	0
Herbert Weldon ..	15,359	0	0
Cope & Raynor, Nottingham*	14,447	1	0
Hawley & Son (withdrawn)	13,683	16	9
* Accepted.			

[Engineer's estimate, £14,400 0 0.]

EBBW VALE (Mon.).—For the erection of public hall, shops, offices, &c., for the Ebbw Vale Central Public Hall Company, Limited. Mr. E. A. Johnson, architect, Abergavenny. Quantities by architect:—

	With Bath Stone Dressings.	With Terra-Cotta Dressings.
	£ s.	£ s.
D. Davis	4,450 0	4,350 0
J. S. Thomas.....	4,368 0	4,362 0
J. Linton.....	4,156 0	—
Thos. Rees	4,277 0	4,197 0
Hatherley & Carr	3,997 0	3,947 0
T. S. Foster	3,990 0	3,902 10
J. D. Williams	3,955 0	3,935 0
W. Lissaman, jun.	3,928 0	—
H. Parfist, Pontnewydd, Mon.	4,000 0	3,902 0*
J. Jenkins & Son.....	3,887 0	3,770 0

[Architect's estimate, £4,000.]
* Accepted.

EGREMONT (Cheshire).—Accepted for the erection of a refuse-destructor, &c., Gorsey-lane, Poulton, for the Wallasey Local Board. Mr. Arthur Salmon, C.E., Public Offices, Egremont:—

Contract A.
L. Marr & Son, Lodge-lane, Liverpool..... £3,500
Contract B.
E. Gabbutt, Oakes-street, Liverpool 1,103
Contract C.
Manlove, Alliott, & Co., Engineers, Nottingham .. 3,145

EXETER.—Accepted at schedule of prices for enclosing and fitting the showyard, &c., for the Devon County Agricultural Association. Mr. J. L. Winter, Totnes, Surveyor:—
J. H. Foaden, Ashburton.

FLEET (Hants.).—For the erection of residences, for Mr. Thos. Kenward. Messrs. Ludford & Tulloch, architects, 39, Victoria-street, London, S.W. Quantities by the architects:—

Pool & Son	£4,886	0	0
Tompsett & Kingham	4,752	0	0
G. Kemp	4,568	0	0
R. Pink	4,555	0	0
Mussellwhite & Son	4,489	0	0
Stephens & Son	4,320	0	0
W. Smith	4,237	0	0
F. Beal	£4,193	7	0
J. A. Sims.....	4,084	10	0
H. Blacknell	4,068	0	0
G. Simonds	3,971	0	0
John Hughes	3,957	12	6
W. Gatfield, Brixton (accepted)....	3,272	0	0

HASTINGS.—Accepted for the supply and delivery of 3,850 yards cast-iron water-pipes for the Corporation. Mr. P. H. Palmer, C.E., Waterworks Engineer, Town Hall, Hastings:—
The Staveley Coal & Iron Company, Ltd., Staveley..... £4 3 6 per ton

KIDDERMINSTER.—For additions to house, Linden-avenue, for Mr. Wm. Adam. Mr. J. M. Gething, architect, Oxford-chambers, Kidderminster:—

Binnian & Co.....	£850	H. Smith	£737
Dorse & Co.	702	J. Guest & Son, Stourbridge (accepted)	730
J. Jones.....	760		

LLANELLY (Carmarthenshire).—For the erection of Llanelly Town Hall. Mr. W. Griffiths, Architect:—

Dd. Jenkins	£13,000	Hatherley & Carr.....	£11,497
Williams & Evans	12,995	Brown, Thomas, & John	11,366
D. C. Jones & Co.	12,985	Thomas & Watkins.....	11,350
H. Wilcock & Co.	12,410	G. Messer	11,188
Newby & Co.....	12,004	W. Bassett	11,150
Lissaman & Co.....	11,580	T. P. Jones, Llanelly* ..	11,000
Q. D. Williams	11,550	* Accepted.	

[Architect's estimate, £11,220 0 0.]

LONDON.—For rebuilding the boys', girls', and male infants' offices in connexion with the Powis-street School, Woolwich; and also for providing a partly new system of drainage, for the School Board for London. Mr. T. J. Bailey, Architect:—

W. V. Goad	£1,112	E. Proctor.....	£900
Holliday & Greenwood ..	977	J. Marsland, Walworth*....	895
A. Black & Son	935	F. J. Coxhead.....	839
*Recommended for acceptance by the Works Committee.			

LONDON.—For rebuilding the teachers' offices in connexion with the Caledonian-road School, Islington, and also for providing a partly new system of drainage at the same time, for the School Board for London. Mr. T. J. Bailey, Architect:—

J. Grover & Son.....	£643	Kirby & Chase, Hornsey-road*	£510
Davis Bros.	593	F. J. Coxhead.....	468
S. Polden	510		
*Recommended for acceptance by the Works Committee.			

LONDON.—For erecting six new water-closets for the infants department of the Brackenbury-road School, Chelsea, and for making the necessary drainage connexions, for the School Board for London. Mr. T. J. Bailey, Architect:—

J. Lyford.....	£189	15	S. Polden..... £144
G. Foxley	185	0	A. Salter*..... 119
*Recommended by the Works Committee for acceptance.			

LONDON.—For the enlargement of the Glyn-road School, Homerton, by 304 places, for the School Board for London. Mr. T. J. Bailey, Architect:—

		If brickwork be built in cement, add
W. M. Dabbs	£3,805 0 0	£74 0 0
G. S. S. Williams & Son ..	3,804 0 0	83 0 0
J. Grover & Son	3,689 0 0	83 0 0
Treasure & Son	3,596 0 0	104 0 0
N. Lidstone	3,530 0 0	65 0 0
E. Lawrance & Sons	3,507 0 0	83 0 0
McCormick & Sons.....	3,482 0 0	74 0 0
C. Cox, Hackney	3,199 0 0*	83 0 0*
*Recommended by the Works Committee for acceptance.		

LONDON.—For various improvements to the Chatham Gardens School, Britannia-road, Hoxton, for the School Board for London. Mr. T. J. Bailey, Architect:—

		If brickwork be built in cement, add
W. M. Dabbs	£3,920 0 0	£65 0 0
W. Gregar & Sons	3,843 0 0	75 0 0
J. Grover & Sons	3,834 0 0	62 0 0
G. S. S. Williams & Son ..	3,798 0 0	70 0 0
N. Lidstone	3,535 0 0	35 0 0
Treasure & Son	3,430 0 0	78 0 0
C. Cox	3,371 0 0	62 0 0
E. Lawrance & Sons	3,357 0 0	62 0 0
McCormick & Sons, Canonbury-road, N.....	3,097 0 0*	54 0 0*
*Recommended for acceptance by the Works Committee.		

LONDON.—For the enlargement of the High-street School, Plumstead, by 393 places, together with the provision of additional water-closets for all departments, for the School Board for London. Mr. T. J. Bailey, Architect:—

		If brickwork be built in cement, add
J. Smith & Sons.....	£4,207 0 0	£80 0 0
Courtney & Fairbairn.....	4,121 0 0	87 0 0
Stimpson & Co.....	4,077 0 0	84 0 0
E. Proctor	3,976 0 0	75 0 0
Kirk & Randall.....	3,761 0 0	80 0 0
McCormick & Sons	3,726 0 0	60 0 0
Holliday & Greenwood	3,577 0 0	70 0 0
H. Lovatt, Wolverhampton*	3,464 0 0	60 0 0
* Recommended for acceptance by the Works Committee.		

LONDON.—For repairs to the Stephen-street, Lisson-grove, Schools, for the School Board for London:—

Eyers	£268	0	0
Lyford	206	0	0
Salter	192	0	0
Cruwys	174	10	0
Eady	172	5	6
Clifton	£160	0	0
Polden	155	0	0
Graham & Graham ..	140	0	0
F. T. Chinchen*	128	15	0
* Accepted.			

LONDON.—For concrete paving at the Star-lane Schools, Canning Town, E., for the West Ham School Board. Messrs. J. T. Newman & Jacques, Architects to the Board:—

Patent Paving and Construction Co...	£311	12	11
Imperial Stone Co...	305	16	2
Homan & Rogers ..	289	13	11
A. Walker	286	15	10
Stuart & Co.	277	18	3
Patent Victoria Stone Co.	273	9	10
Hobman & Co.....	270	10	0
J. Hancock	£262	0	0
Bradford & Co.....	244	0	0
Patent Indurated Stone Co.	242	14	9
Malcolm Macleod & Co.	241	7	0
Metallic Paving and Artificial Stone Co.*	235	0	7
*Accepted.			

LONDON.—For tar-paving to playgrounds at the West Silverton Schools, Victoria Docks, E., for the West Ham School Board:—

G. G. Rutty	£475	Bensted & Son.....	£305
J. Smart	368	John Jackson.....	295
Constable & Co.....	331	Asphaltic Limestone Concrete Co.*	286
Hobman & Co.....	309		
*Accepted.			

LONDON.—For the formation of roads, paths, and airing courts at the infirmary, Marloes-road, W., for the Guardians of the Poor of the Parish of St. Mary Abbot's, Kensington. Mr. T. W. Aldwinckle, architect:—

J. Meston	£3,897	J. Bowles.....	£2,100
Fry Bros.....	3,482	T. Adams	2,098
Lagdon & Crawford	2,800	G. Wimpey & Co.	2,068
J. Bendon	2,740	W. Johnson & Co., Ltd.	2,065
Robertson & Grant	2,270	G. Neal	2,008
J. Mears	2,150	Mayo & Co.	1,978
G. G. Rutty.....	2,125	*Accepted.	
Hobman & Co.*	2,102		

LONDON.—For New Amersham Grove Sunday School, New Cross, S.E. Mr. George Baines, architect, 4, Gt. Winchester-street, E.C.:—

F. & H. F. Higgs ...	£1,801	0	0
H. L. Holloway	1,730	0	0
B. E. Nightingale ..	1,728	0	0
E. Houghton	1,705	0	0
J. C. Richardson ..	1,701	0	0
S. J. Gorham	1,686	8	10
Battley, Sons & Holness.....	£1,679	0	0
T. J. Coxhead	1,543	0	0
S. J. Scott.....	1,539	0	0
Thos. D. Long, 230, Evelyn-st., Deptford	1,420	0	0

LONDON.—For rebuilding the premises at 58, Powis-street, Woolwich, S.E., for Messrs. S. H. Cuff & Co. Mr. H. H. Church, architect, William-street, Woolwich. Quantities by Mr. W. Whincop, 44, Norcott-road, Stoke Newington, N.:—

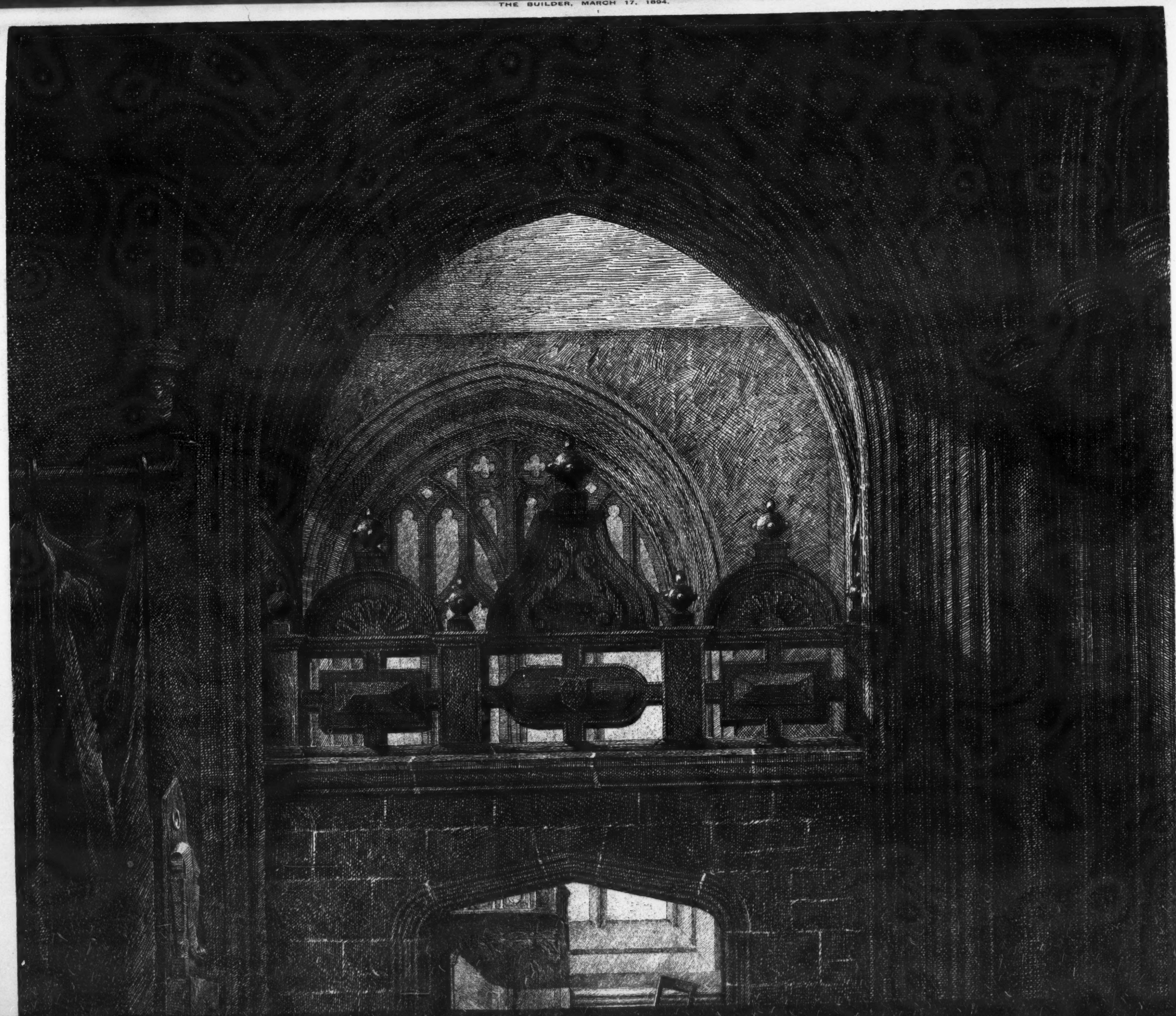
Chessum & Sons.....	£1,260	H. Brown	£1,169
Multon & Wallis.....	1,259	Halaam Bros.	1,133
H. L. Holloway	1,244	J. Chapman	1,077
Young & Lonsdale	1,230		

LONDON.—For alterations and additions to Montague House, No. 57, Shepherd's Bush-green, W., for Mr. T. Pocklington. Mr. E. Monson, jun., architect, Acton-vale, W.:—

Thomas Nye	£559	Chamberlen Bros., 182, Hammersmith-road, W. (accepted)	£519
George Lyford	543		
George Hooper	536		

NEWBURY.—For additions, &c., to business premises, Cheap-street, for Messrs. McIlroy & Rankin. Mr. W. H. Bell, architect, Market-place, Newbury:—

George Head	£389	0	0
Jas. A. Dann	384	12	6
Samuel Illiott.....	347	19	3
W. H. Taylor & Son	£349	10	0
Messrs. James & Son, Newbury (accepted)	330	0	0



PETERBOROUGH.—For additions, &c., to house and shop, for Mr. M. E. Seaton. Mr. N. Hall, architect. Quantities by architect :—

Sibley	£265	Gray	£256
Bailey	265	Maclin	250
Pape	265	Wenlock, Peterborough*	249

* Accepted.

ROTHERHAM.—Accepted for the erection of a pair of semi-detached villa residences, Moorgate-road, for Mr. C. E. Chrimes. Mr. J. Platt, architect, Old Bank-buildings, Rotherham :—

Richard Snell, Rotherham £1,859 0 0

RUSHDEN.—For the erection of shop and two houses, Queen-street and Rectory-lane, for Messrs. E. Claridge & Son. Mr. H. Adnitt, architect, Harboro'-road, Rushden. Quantities by the architect :—

A. Trayner	£670	T. & C. Berrill	£513
H. Knight	545	W. H. Lovell	506
Bayes & Son	539	R. Marriott, Rushden*	506
T. Willmott, Jun.	528		

* Accepted.

RYDE.—Accepted for alterations, &c., to "The Turk's Head," Ryde, for Mr. Edward Sweetman, sen. Mr. John J. Barton, architect :—

C. Langdon £297 10 0

SEVENOAKS.—For supplying 1,340 yards local stone, &c., for the Local Board. Mr. Jabez Mann, C.E. surveyor, Argyle-road, Sevenoaks :—

	Per yard. s. d.	s. d.
E. B. Chittenden, West Malling, 620 yds. of local stone	4 11 to	5 10
P. Bagwell, Sevenoaks Weald, 80 yds. gravel	4 5	—
" " " 490 yds. local stone	4 10 to	5 6
George Rye, Bailey's-hill, Sevenoaks, 150 yds.	4 6	—

SILLOTH (Cumberland).—Accepted for the erection of school buildings, offices, &c., for the School Board. Mr. George Armstrong, architect, 45, Louther-street, Carlisle. Quantities by the architect :—

Building.—J. Johnston, Silloth	£646	3	0
Joinery.—J. R. Thomson, Silloth	245	0	0
Slating.—J. Whitfield, Workington	54	0	0
Plumbing.—Thomson & Sons, Carlisle	47	16	5
Plastering.—Johnston Bros., Silloth	39	4	2
Painting.—Watson, Silloth	55	17	11
Ironrailing.—Gouge, Carlisle	12	6	0

SLAITHWAITE (Yorks.).—For the erection of school buildings, house, &c., Wilber Lee, for the U.D. School Board. Mr. J. Berry, architect, 9, Queen-street, Huddersfield :—

Mason.—Mr. Wm. Holroyd, Crimble, Slaithwaite	Total cost, £2,077.
Joiner.—Messrs. J. Varley & Sons, Slaithwaite	
Plumber.—Mr. Francis Goodhall, Marsden	
Plasterer and Painter.—Mr. James Walker, Slaithwaite	
Slater and Concreter.—Mr. W. E. Jowitt, Johnway-street, Huddersfield	
Heating Apparatus.—Mr. J. W. Thornton, Fitz-william-street, Huddersfield	

TUNSTALL.—For the erection of a block of school buildings for the Wolstanton School Board. Mr. R. A. Wood, Architect, Town Hall Buildings, Tunstall :—

T. Goodwin	£7,120	C. Smith	£6,700
W. Grant	7,110	Yorke & Goodwin	6,690
C. Cope	6,786		

UPTON PARK.—For the erection of the Credon-road Schools (1,576 school places), manual instruction, and penny dinner-room, &c., for the West Ham School Board. Messrs. J. T. Newman & Jacques, architects. 2, Fen-court, E.C. Quantities by Messrs. R. L. Curtis & Sons :—

Balaam Bros.	£23,638	Lorden & Son	£20,420
Hart Bros.	23,384	Reed & Son	20,247
Allen & Son	22,425	Gregar & Son	19,819
Hearle & Farrow	21,887	Stimpson & Co.	19,790
H. Lovatt	21,763	Holt & Son	19,575
Lawrence & Son	20,637	W. J. Maddison	19,140
Geo. Sharpe	20,450	T. J. Coxhead*	18,659

*Accepted subject to the approval of the Education Department.

WALTHAMSTOW.—New class-room, St. Michael and All Angel's Schools, Walthamstow. Mr. W. A. Longmore, architect :—

Thomerson & Son	£639	E. J. English*	£564
S. J. Scott	573		

*Accepted.

WIMBLEDON.—For granite concrete paving, for the Wimbledon Local Board :—

	In Situ. At per yard super. 2-in. s. d.	3-in. s. d.	Slab. At per yard super.
W. B. Wilkinson & Co., Ltd.	3 6	—	—
Wm. Adamson	3 2	4 5	—
Adamant Stone Co., Ltd.	—	—	On rail, 4s. 6d. Laid, 5s. 3d.
Jones's Annealed Concrete Co., Ltd.	3 7	5 5	5s. 0d.
Patent Paving and Construction Co. Ltd.	3 4	4 9	—
Patent Indurated Stone Co., Ltd.	3 3	4 2	—
Alfred Walker	3 8	4 6	—
Stuart's Granolithic Paving Co., Ltd.	— ..3-in.	3 8	—
Do.	— ..4-in.	4 8	—
John Mowlem & Co., Grosvenor Wharf, Millbank, Westminster, S.W.*	3 0	3 10	—
Malcolm Macleod & Co.	3 4	4 9	—
Fry Brothers	5 6	7 6	—
Imperial Stone Co., Ltd.	3 9	4 9	—
J. E. Broderick & Co.	3 7	4 6	—
The Patent Victoria Stone Co., Ltd.	4 2	5 0	—
The Brunswick Road Ashphalte Paving Co., Ltd.	— ..4-in.	6 0	—

* Accepted.

Tar Paving.

	3 in., at per yard super. s. d.	4 in., at per yard super. s. d.
W. E. Constable & Co., Monument Chmbrs., King William-street, E.C. (accepted)	1 10	2 5
J. E. Broderick & Co.	2 6	—
S. Atkins	2 0	2 6
A. C. W. Hobman & Co.	1 11½	2 7
Fry Bros.	1 9½	2 2½
J. Wainwright & Co.	1 9	2 4
D. Marchu & Co.	1 9	—
J. Smart	2 0	2 9
Edmund Iles	1 11	2 6

Blue Brick Paving.

	2 in., at per yard super. s. d.	3 in., at per yard super. s. d.
Wm. Adamson	3 2	4 0
J. E. Broderick & Co.	3	3 8
Edmund Iles	3	4 2

WREXHAM.—For constructing three new streets, Red House Estate, for the trustees of the late Mr. B. Piercy. Mr. Wm. Davies, engineer, Island Green House, Wrexham. Quantities by the engineer :—

John Burnham	£725 0	James Hughes	£566 19
Charles Huxley	648 0	E. Bradshaw	490 0
W. E. Samuels	630 0	A. Johnson, Wrexham*	480 0
William Owen	600 0		

* Accepted.

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FOR ALL THE PROVED KINDS OF
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FLUATE, for Hardening and Preserving
Calcareous Stones and Marbles.

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THE BUILDER, MARCH 17, 1894.

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NEW THEATRE, ROTTERDAM.

ENTRANCE ELEVATION.

HERR J. VERHEUL. ARCHITECT.

Scale of Metres.

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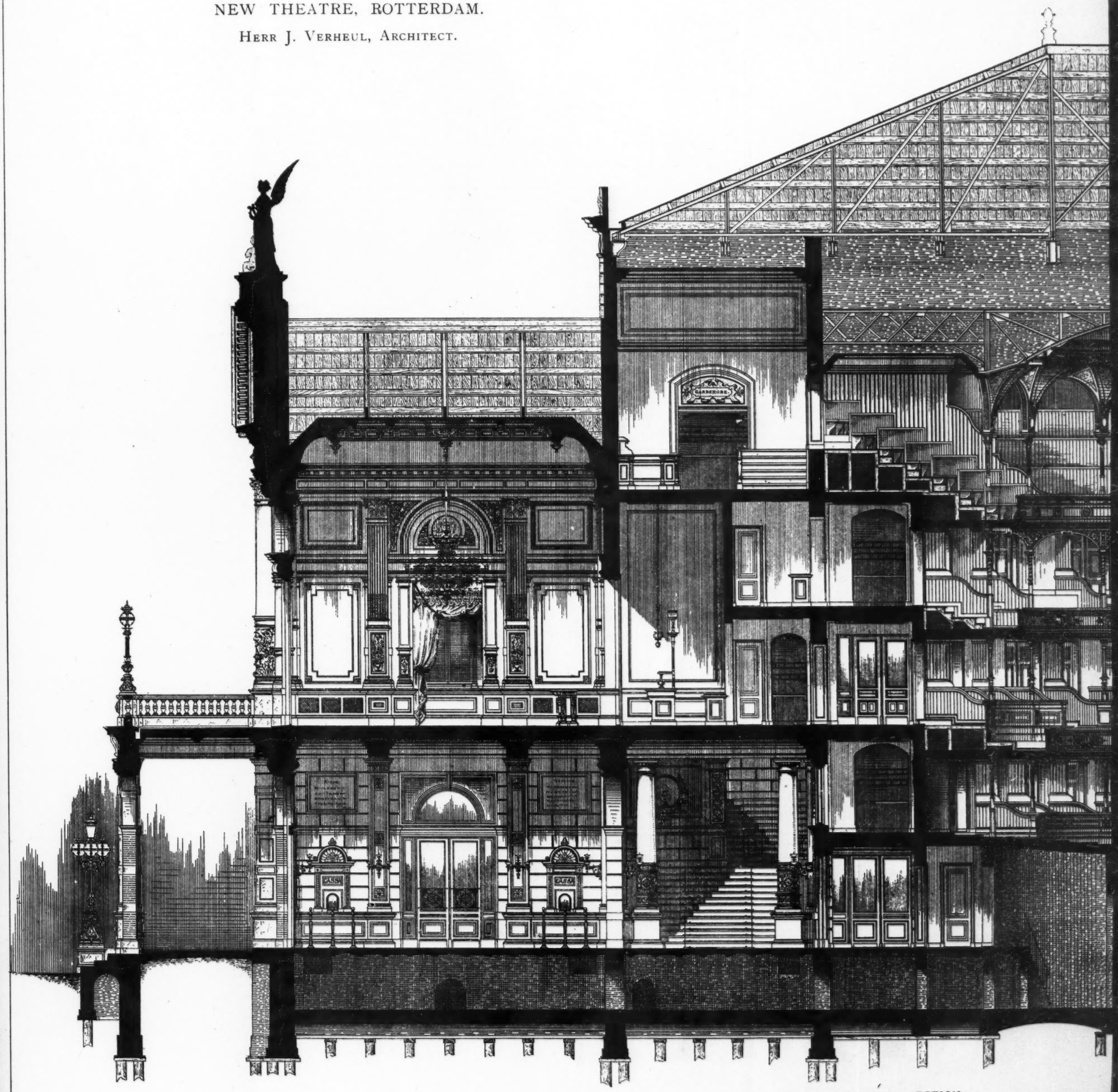
NEW THEATRE, ROTTERDAM.

HERR J. VERHEUL, ARCHITECT.



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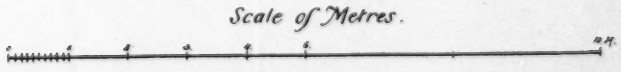
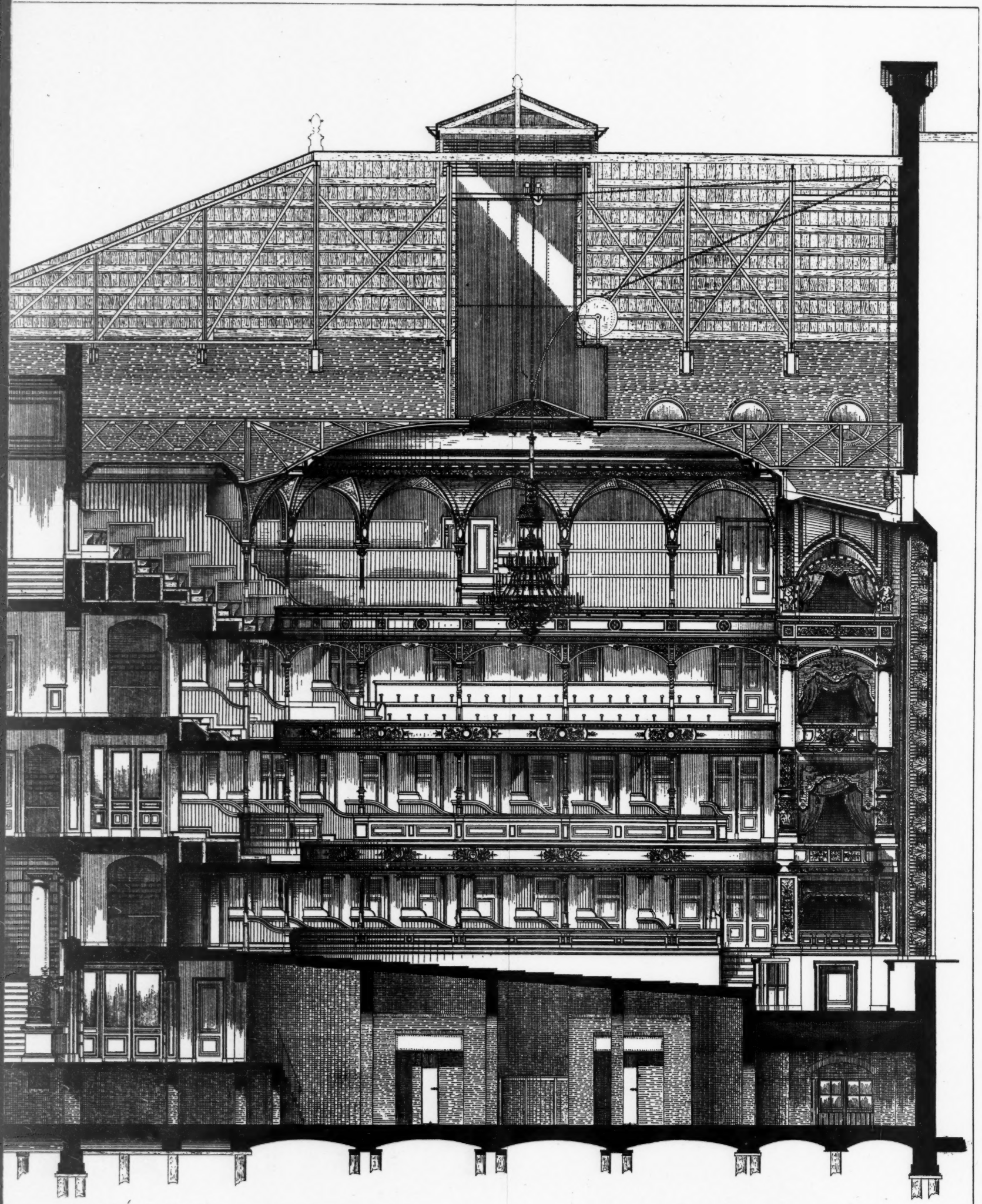
Scale of Metres.





LONGITUDINAL SECTION.

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Fig. 1.—GRANITE. Carnsew, Cornwall.

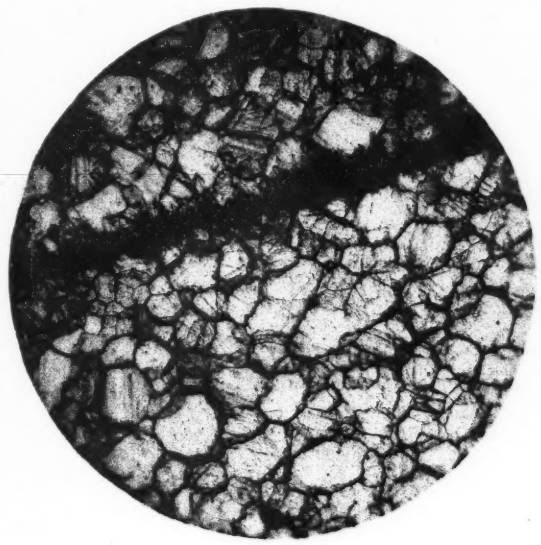

Fig. 2.—MARBLE. Carrara, Italy.

Fig. 3.—BANDED SHELLY LIMESTONE.
Ham Hill, near Yeovil.

Fig. 4.—FRAGMENTAL LIMESTONE.
Doulting (Chelynch bed), Somerset.

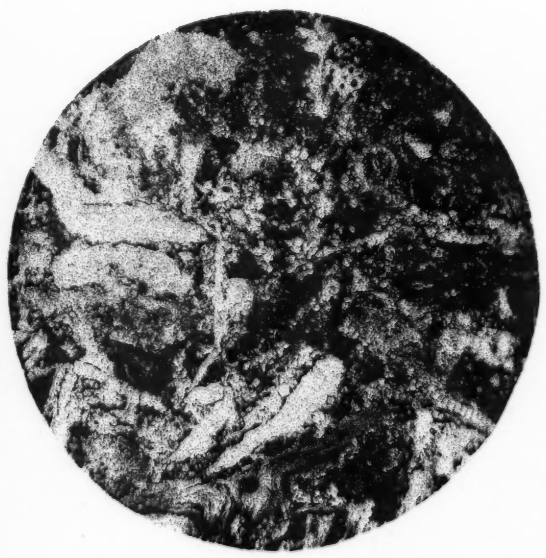

Fig. 5.—VERY HARD LIMESTONE.
(Organically formed), Charfield, Glo'ster.

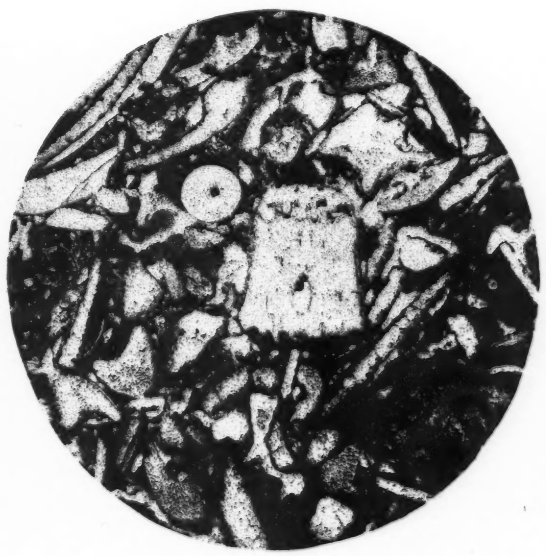

Fig. 6.—SHELLY LIMESTONE.
Bath Stone, Westwood (Paving bed).

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THE MICROSCOPIC STRUCTURE OF ROCKS
(See the Students' Column.)

Fig. 7.—ORGANIC-FRAGMENTAL
Doulting (Brambleditch bed).

Fig. 9.—COARSE SHELLY-OOLITI
Bath Stone (Westwood gr

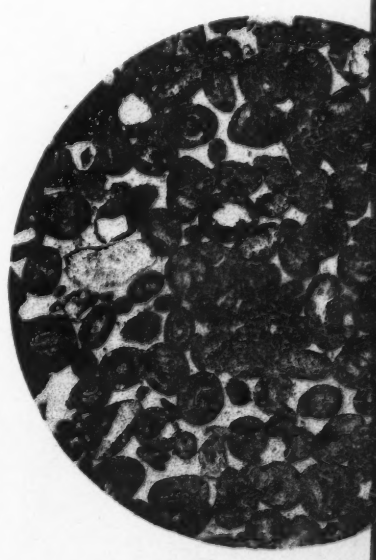

Fig. 11.—FINE OOLITIC LIM
Portland Stone (Tout qua

TH

Fig. 7.—ORGANIC-FRAGMENTAL LIMESTONE.
Doulting (Brambleditch bed), Somerset.

Fig. 8.—SHELLY OOLITIC LIMESTONE.
Bath Stone, Winsley ground.

Fig. 9.—COARSE SHELLY-OOLITIC LIMESTONE
Bath Stone (Westwood ground).

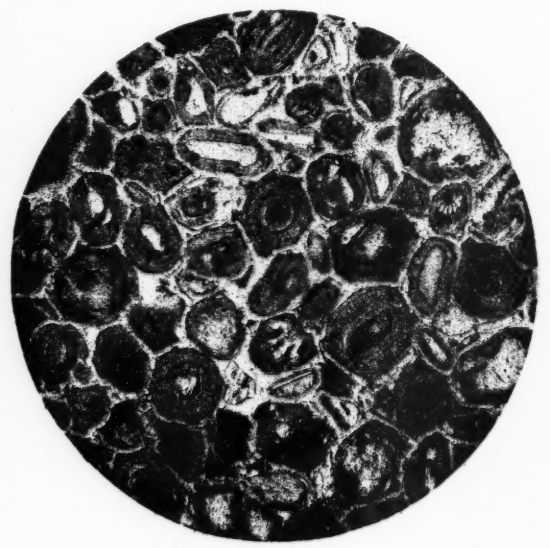

Fig. 10.—OOLITIC LIMESTONE.
Bath Stone, Kingsdown.

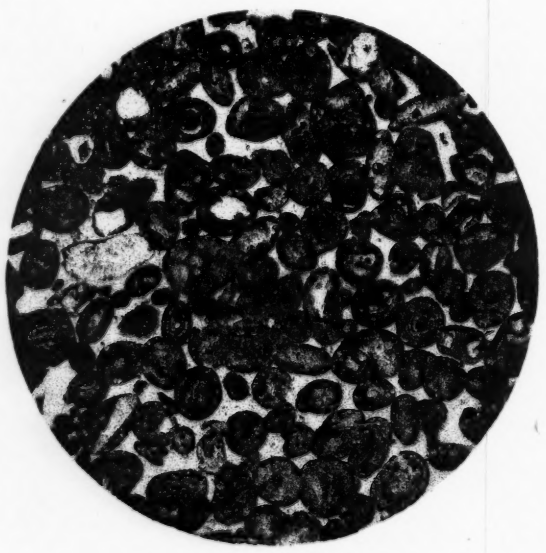

Fig. 11.—FINE OOLITIC LIMESTONE
Portland Stone (Tout quarry).

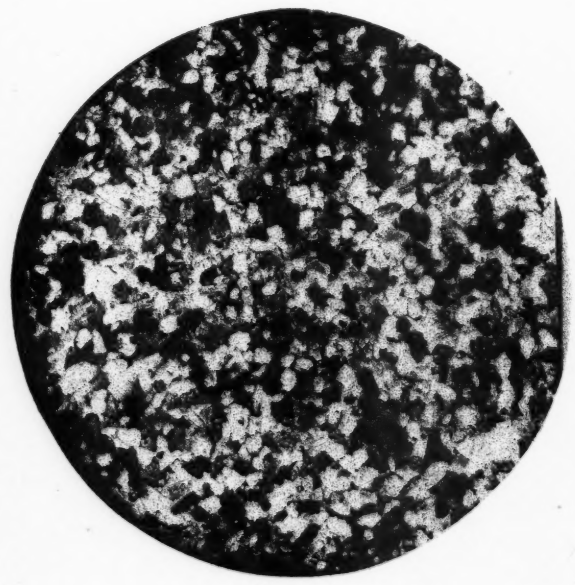

Fig. 12.—SANDSTONE.
Corsehill, Annan, Dumfries.

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THE MICROSCOPIC STRUCTURE OF ROCKS

(See the Students' Column.)